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THE  
NATURAL HISTORY  
OF  
BRITISH INSECTS;  
EXPLAINING THEM  
*IN THEIR SEVERAL STATES,*  
WITH THE PERIODS OF THEIR TRANSFORMATIONS, THEIR FOOD,  
OECONOMY, &c.

TOGETHER WITH THE  
HISTORY OF SUCH MINUTE INSECTS  
AS REQUIRE INVESTIGATION BY THE MICROSCOPE.

THE WHOLE ILLUSTRATED BY  
*COLOURED FIGURES,*  
DESIGNED AND EXECUTED FROM LIVING SPECIMENS.

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BY E. DONOVAN, F.L.S.

AUTHOR OF THE NATURAL HISTORIES OF BRITISH BIRDS, SHELLS, &c. &c.

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VOLUME I.

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London:

- PRINTED FOR THE AUTHOR,  
AND FOR  
F. C. AND J. RIVINGTON, No 62, ST. PAUL'S CHURCH-YARD  
*By Bye and Law, St. John's Square, Clerkenwell.*

1804.



TO

T. MARSHAM AND A. M'LEAY, ESQRS.

TREASURER, AND SECRETARY,

OF THE

## LINNÆAN SOCIETY.

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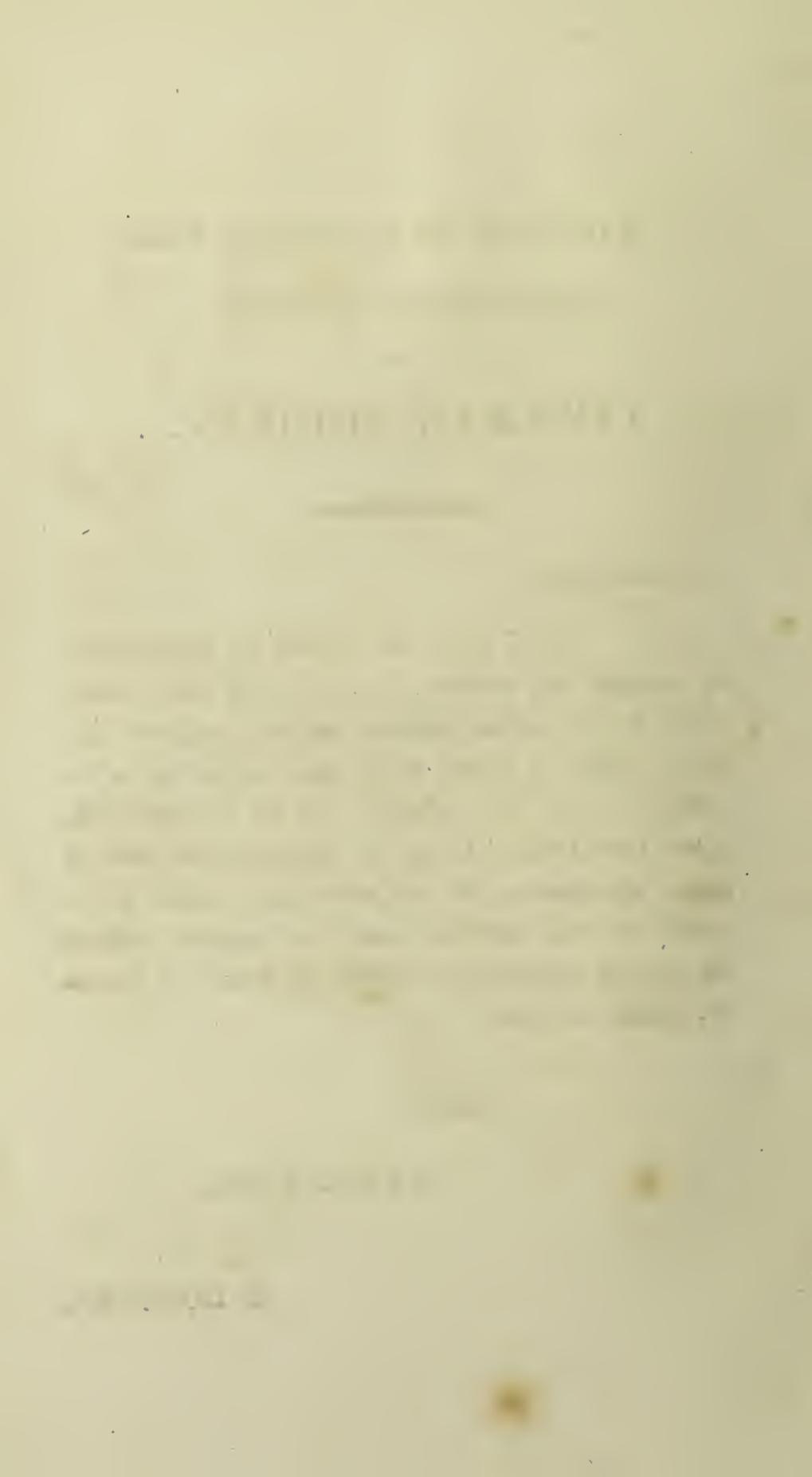
MY DEAR SIRS,

IF I were not anxious to acknowledge you amongst the number of those, whose useful information has in various instances tended to improve this Work, motives of esteem would alone induce me to inscribe it to you. The reflection, that for ten years past, it has been sanctioned with no inconsiderable share of public approbation, will not allow me to believe it unworthy of your attention, and its conclusion affords me the best opportunity to testify the favour, as well as the respect, with which

I remain,

Most sincerely yours,

E. DONOVAN.



## ADVERTISEMENT.

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AT the conclusion of a Work which has been published in a progressive manner, and either in the form of Monthly Numbers or Annual Volumes, has already passed the ordeal of public criticism, the Author can have little to advance in favour of the design, or the manner in which it has been executed. His chief object was to illustrate the science of Entomology on a more extensive scale than had been previously attempted in this Country, and he trusts, upon the whole, his endeavours in this respect have not been fruitless.

As a general History of the Insect Productions of Great Britain, it is presumed this work will be found sufficiently copious and instructive; for, though the Author has purposely avoided entering too deeply amongst the minutiae of the Insect race, he has been careful to include whatever is interesting. The selection of Papiliones or Butterflies is extremely ample, as well as that of the Sphinges

## A D V E R T I S E M E N T.

or Hawk Moths: none of the larger kinds of Phalænæ of Moth tribes have been overlooked, and the number of those of an inferior size that are extremely rare, or particularly beautiful, are altogether considerable. Those are chiefly alluded to, because general observes are more immediately interested with the uncommon elegance of the Lepidopterous tribes than others. In general, however, the reader will meet with some information in every department, as nothing material in any cabinet to which he has access has been omitted.

The arrangement of the subjects is for the most part conformable to the system of Linnæus, with occasional reference to the writings of Fabricius. This is designed to assist the labours of the practical Entomologist, and by combining novelty with beauty, and scientific information, may induce many other attentive observers of nature, to pursue this pleasing and interesting study.

The Author cannot but feel some degree of satisfaction in having, at least, fulfilled the chief object of his first design; and, after the labour of ten years, completed a Work, perhaps the most extensive that may ever appear, in this form, on the subject of British Entomology; but this consideration will not permit him to entirely abandon his favorite pursuit: his attention will be still directed to a science in which the past indulgence of a liberal public

lic

## ADVERTISEMENT.

lic, have induced him to believe he may still be useful, and though he cannot, consistently with the conditions of this undertaking, extend it further at this time, should a sufficient number of new and valuable species occur, he will certainly be tempted to transgres, and make some additon to the present selection.

ALPHA-

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A

S L I G H T   S K E T C H  
O F   T H E  
A N I M A L   S Y S T E M.

---

LINNÆUS divided the Animal System into six classes.

Class I. MAMMALIA. Suckle their young.

I I. AVES. (Birds) covered with feathers.

III. AMPHIBIA. Lungs arbitrary.

IV. PISCES. (Fishes) breath by gills not arbitrarily.

V. INSECTA. (Insects) two antennæ.

VI. VERMES. No head.

Insects therefore compose the fifth Class in the System, and are divided into seven Orders.

Order I. COLEOPTERA. Wings two, covered by two shells, divided by a longitudinal future.

II. HEMIPTERA. Shells or covers of the wings somewhat soft, and incumbent on each other.

III. LEPIDOPTERA. Wings four, imbricated with minute scales.

**IV. NEUROPTERA.** Wings four, naked, transparent, reticulated, with veins or nerves. Tail without sting.

**V. HYMENOPTERA.** Wings four. Membraneous. Tail of the female armed with a sting.

**VI. DIPTERA.** Wings two.

**VII. APTERA.** No wings.

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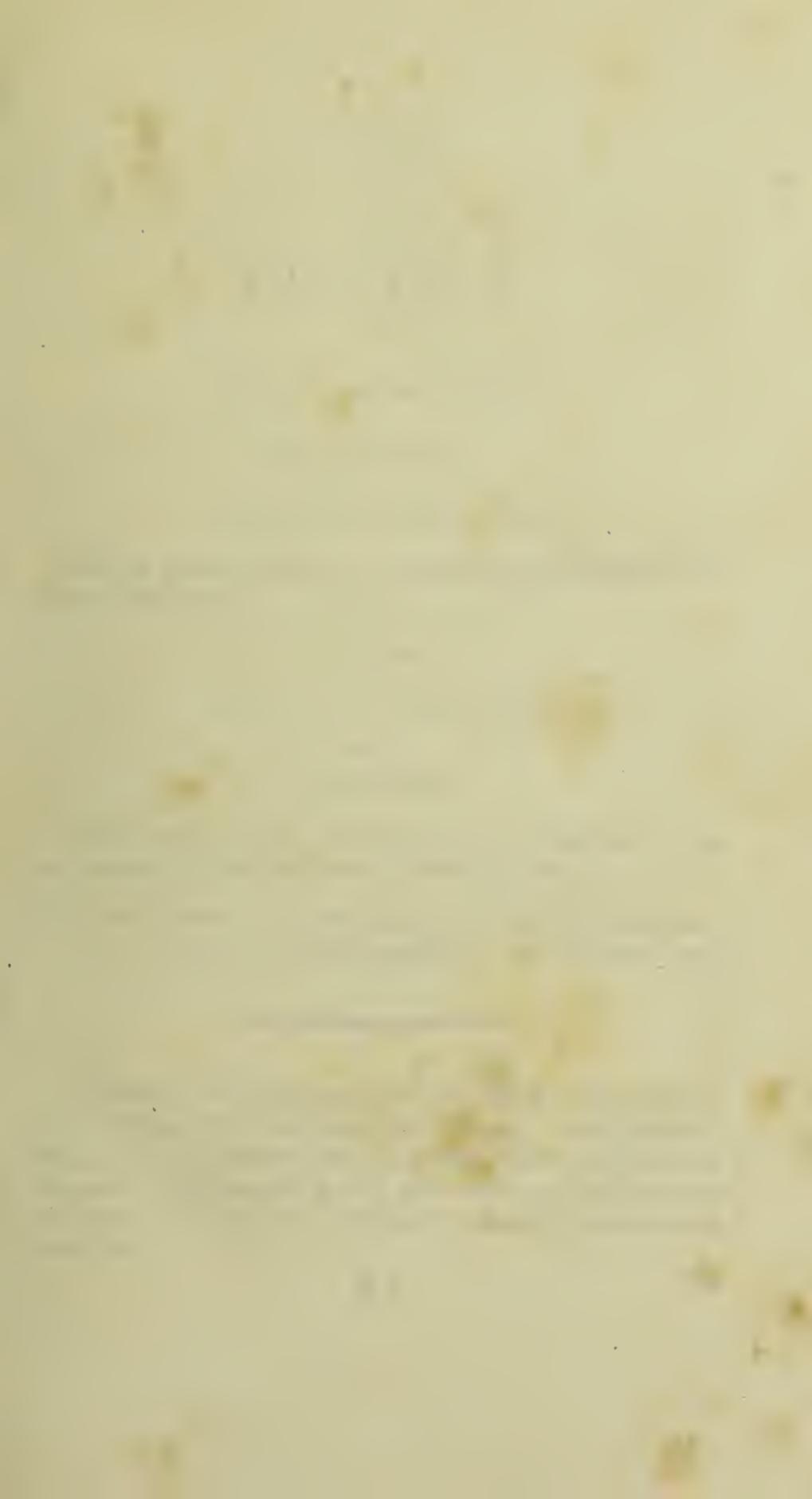
#### TRANSFORMATIONS OF INSECTS.

Many of our readers are no doubt acquainted with the singular transformations Insects undergo, but we trust those will pardon a digression which may be useful to those who have not that knowledge; and without premising farther we proceed to inform them, that Insects in general undergo a material change in their form at stated periods of their lives; there are some, though few, which burst forth from the egg perfectly formed, as *Spiders*, &c. but the greater part exist in four several states: the first that of the egg, whence the Larva, or Caterpillar is produced; it is at first very minute, but in this state it feeds, some kinds on one or two plants only, others promiscuously on many, they therefore continue to increase in size, moulting several times the outer skin, until the destined period of their dormant state approaches; they then spin a web more or less strong according to the species, and are converted into the aurelia, or chrysalis; and lastly they burst forth in due season perfectly formed. It is under this form they propagate a future race, and themselves perish, as they rarely survive the inclemencies of the winter.

The antient naturalists held suppositions very imperfect and erroneous relative to those transformations, but *Malpighi* and *Swammerdam* proved by many accurate examinations clearly, that those changes were not suddenly effected, but gradual; and that under the form of the Caterpillar they could distinguish the future changes the Insect would undergo.









## PLATE I.

## PHALÆNA PAVONIA.

EMPEROR-MOTH.

## GENERIC CHARACTER.

Antennæ tapering from the base: wings in general deflected when at rest. Fly by night.

*Bombyx.*

## SPECIFIC CHARACTER

AND

## SYNONYMS

Wings rounded, grey, clouded, and barred with brown; an ocellar semitransparent spot in the middle of each wing.

PHALÆNA pavonia: alis rotundatis griseo nebulosis subfasciatis: ocello nictitante subfenestrato. *Linn. Fn. Suec.* 1099.

The male is smaller than the female, its colours much darker on the upper wings, the lower orange, and the antennæ as in the rest of the Bombyces considerably pectinated, while those of the female are setaceous. The caterpillar is of a green colour, with a black ring surrounding each joint, and every ring is beset with several yellowish tubercles.

The conformity and likeness which prevails between the male and female throughout the greater part of the animal system, cannot however in Insects be implicitly depended on ; the difference in many is such as even to mislead some very accurate Entomologists, the illustrious Linnæus not excepted. In this species it is not so great as in many, but such as entitles the female to a figure in a future plate : Our figure is of the male.

Albin, (*Plate 25, Subject 37,*) has given a figure of the male and female on the same plate, and describes a male to have changed to the aurelia state as in our plate represented *July 16*, and *March 18* following to have produced the Fly. But the time of their appearance depends on the proportion of heat or cold; as the author's subject was preserved from the severity of winter, in a warm room. The usual time to find them in the caterpillar state is *August*, and in *April* the Fly.

The singular provision which nature makes for the protection of this Fly deserves particular notice ; when the time of its continuation in the caterpillar state is expired, by much labour it forms a kind of bag or purse, of a very tough substance; this it fixes against the trunks of trees, &c. by a number of hairs or filaments, which remain on the external surface. It lines the outer case by one of a finer texture, the top of which is closed by several bristles that unite in the center, exactly representing a cap, and excludes almost the possibility of its receiving an injury during this defenceless state. In this bag it passes to the aurelia, and remains until the birth of the perfect insect.—Our figure represents the chrysalis or aurelia in the bag ; part appears torn away to exhibit its situation therein.

Were we to unite the several accounts of authors respecting its food, it would appear to be a general feeder ; it will live on the rose, the elm, and the willow ; and on thorns and brambles particularly.





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## P L A T E II.

## F I G. I.

MONOCULUS QUADRICORNIS.

APTERA.

## GENERIC CHARACTER.

Legs from four to eight, formed for swimming, and very long : body covered by a shell divided into segments : Antennæ either four, two, or none ; eyes one, or two, approximate and fixed in the shell : feelers four, and in continual motion when swimming : posterior ones very small and hooked.

## SPECIFIC CHARACTER.

Antennæ four : tail straight and bifid ; the divisions ramosæ.

---

Although this insect may have been noticed by many, swimming, or rather darting swiftly in various directions in water ; its minuteness is such, that the most attentive could never have comprehended precisely its component parts. The microscope discovers it to be an animal of such singular formation as highly to deserve the attention of the naturalist. It is covered by a hard shelly substance, divided into annulations, and armed in several parts with spines and bristles ; notwithstanding which, this shell is so transparent that the whole motion of the intestines is very visible by a good magnifier.

It must be granted that, but for the microscope, the wonders of the minute creation, would be to us entirely unknown; our ideas could never suppose the existence of those animated forms which occupy the immeasurable space between an apparent atom and nothing. The myriads of animals, thousands of times smaller than a mite, must evade our cognizance, and be an actual conviction of their non-existence.

But with all the utility that the microscope can boast, no instrument is so likely to mislead the most accurate observer, particularly if not in the habit of using it; the variations of light, the difference of the magnifying powers, or the damage the glasses may meet with by accident, such as requires every one to examine with the greatest care; one degree of light may bring an object to view, whilst another may entirely blend it with the fluid it exists in; or one glass may discover spines on an object, another glass might have represented perfectly smooth; it is therefore necessary to begin with a small power, in proportion to the size of the object, and to proceed to deeper magnifiers after.

There is some difference in our figure, and those either of *Barbut*, or of *Baker*, which appears chiefly from our using a single lens nearly of the deepest power convenient to use. Our glasses were the 20th and 30th of an inch focus.

We very attentively examined the eyes, and found, not one, but two, placed near each other, on a scale or plate of a black colour; hence arises the appearance of a single eye by a small magnifying power.

The tail presents a forked appearance by a deep power, and the eggs are contained in two bags, one on each side the tail. The colour varies probably in proportion to the nature of its food, to pale green, more or less of a red, or of a grey brown colour.

## F I G. II.

This minute animalcula is frequent in stagnant water, or in infusions of vegetables, and is one species of those whose existence can only be discovered by a good microscope. It is very difficult, considering the power those creatures have to distort their true form at pleasure, to fix their distinguishing character: therefore where the definition appears dubious, we prefer being silent rather than hazard an error.

FIG. 2. Represents them (*magnified*) as they sometimes seem to follow the leader in herds; but perhaps it is only the scent of the prey that induces each to follow the foremost, as they frequently swim or whirl in the water separately, with great swiftness, devouring the smaller kinds of animalculæ.

FIG. 3. Two, magnified by a deep power, when they appear to have feet or fins.

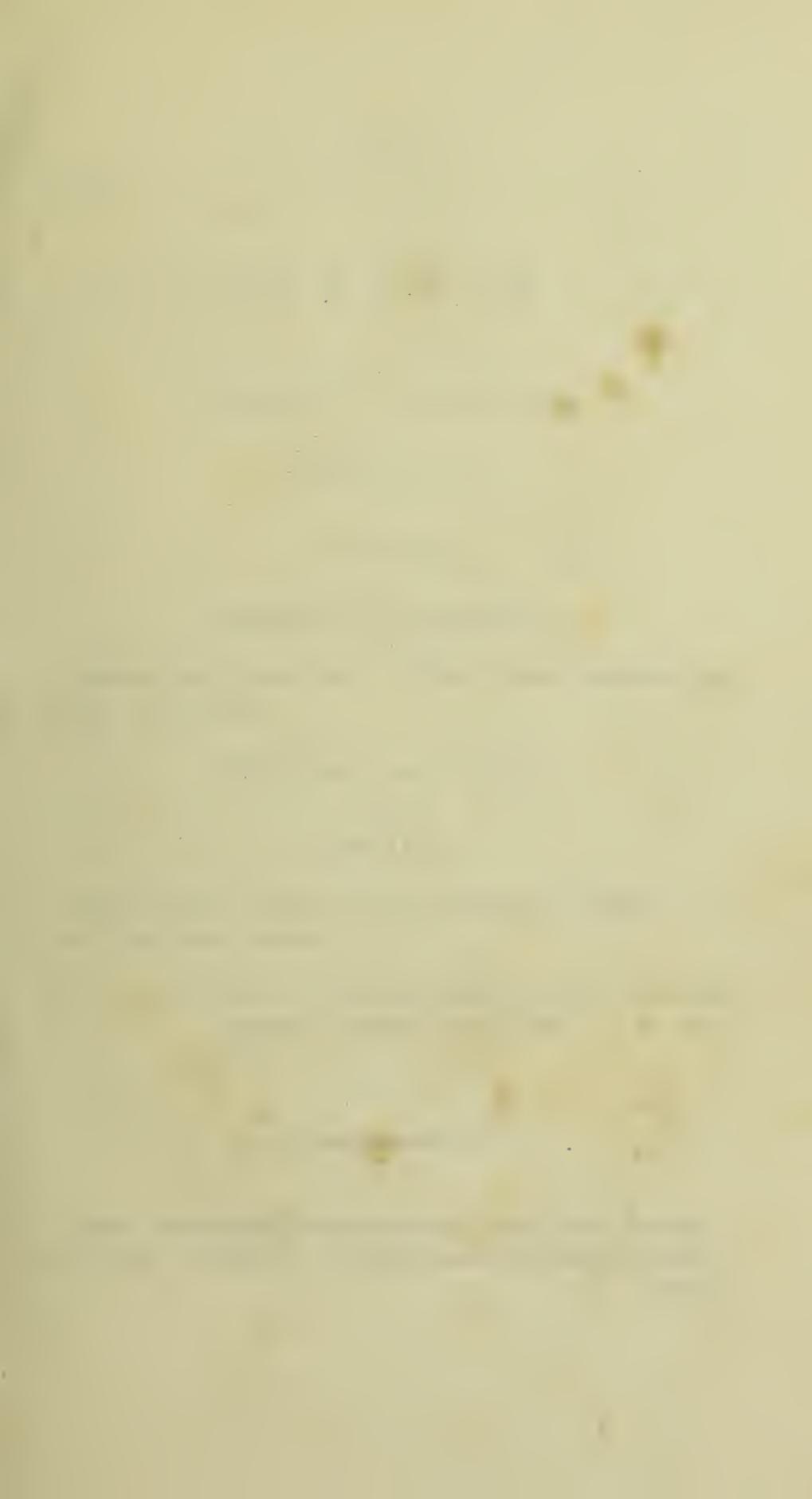
FIG. 4. Shews the strange form it assumes whilst depositing its eggs.

FIG. 5. The eggs deeper magnified.











## PLATE III.

## PHALÆNA BUCEPHALA.

BUFF-TIP MOTH.

LEPIDOPTERA.

## GENERIC CHARACTER.

Antennæ taper from the base. Wings in general deflected when at rest. Fly by night.

## SPECIFIC CHARACTER

AND

## SYNONYMS

Anterior wings cinereous, with two ferruginous streaks, and a large yellow spot at the end.

PHALENÆ BUCEPHALA: alis cinereis: strigis duabus ferrugineis maculaque terminali magna flava. *Lin. Fn. Suec.*  
1115.

The delicate assemblage of beautiful down which clothe the upper wings of the Buff-tip Moth is its chief recommendation; the history affords

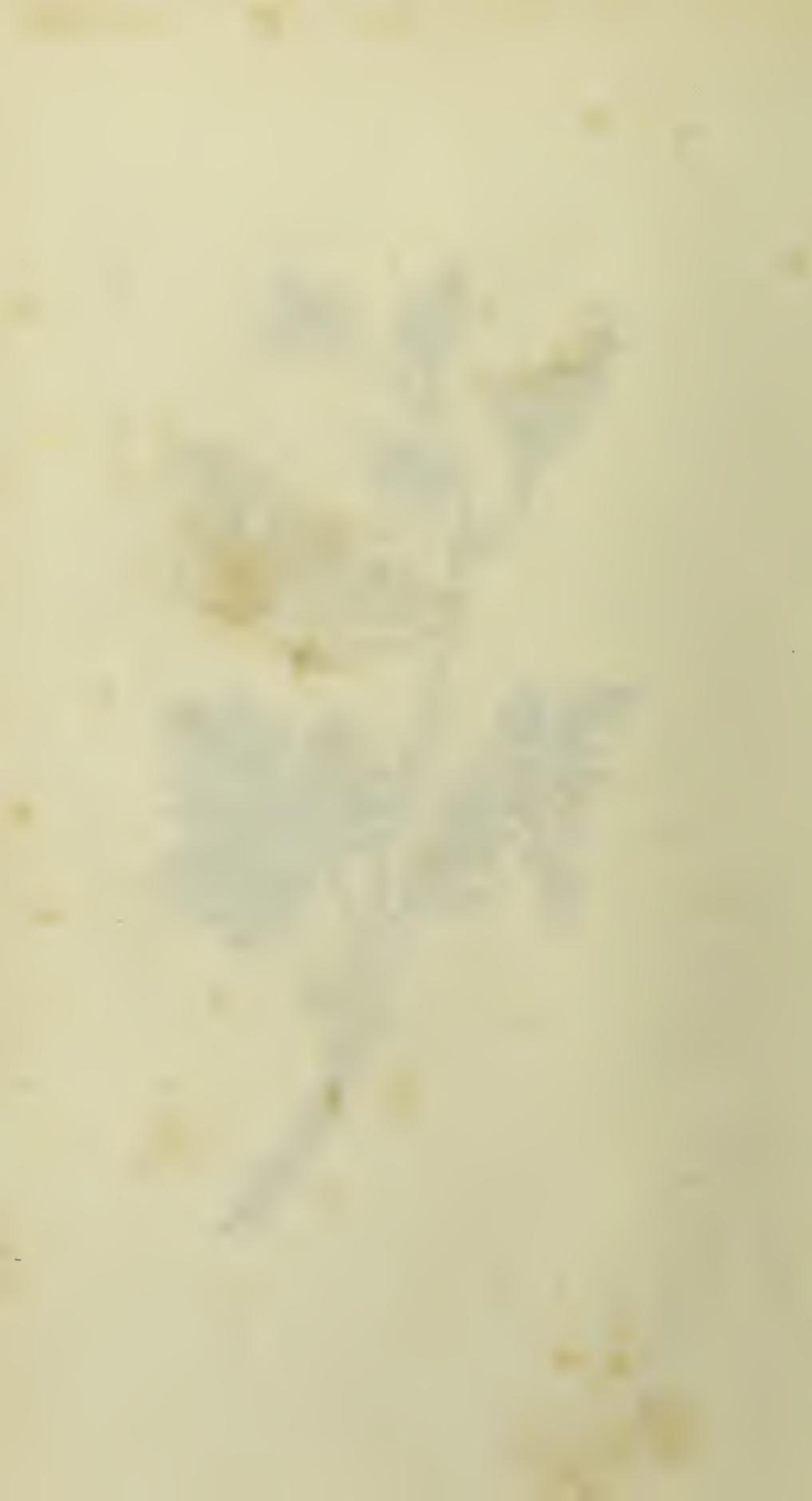
affords but little for observation, it is hatched from the egg in *August*, and in *June* following the fly appears in the winged state.

The Caterpillar is yellow varied with specks, and spots of black, and orange, and is somewhat hairy : it feeds on the oak and ash.









## P L A T E IV.

## PHALÆNA GROSSULARIATA.

MAGPYE, or Currant-Moth.

## GENERIC CHARACTER.

The Antennæ setaceous. Wings in general deflected when at rest. Fly by night.

## SPECIFIC CHARACTER

AND

## SYNONYMS.

Wings whitish, with round black spots, and a yellow streak on the anterior pair.

PHALÆNA GROSSULARIATA: alis albidis: maculis rotundatis nigris, primaribus strigis luteis. *Linn. Faun. Suec.* 1261.

The Magpye-Moth is one of the *geometræ*; and feeds on Gooseberry and Currant-bushes, as the name indicates. The Caterpillar is found in May; and in July, the Fly.

The Caterpillar, previous to its change to the Chrysalis state, spins a web of a very slight and delicate texture, by which it is suspended horizontally against the branches of trees, &c, as in our Plate represented.







3







## PLATE V.

## FIG. I.

## MONOCULUS CONCHACEUS.

## APTERA:

## GENERIC CHARACTER.

Legs from four to eight, formed for swimming, and very long: body covered by a shell divided into segments: Antennæ either four, two, or none; eyes one, or two, approximate and fixed in the shell: feelers four, and in continual motion when swimming: posterior ones very small and hooked.

## SPECIFIC CHARACTER.

Shells ovate and downy.

---

To acquire a proper knowledge of the formation of this minute insect, it is necessary to use a microscope with a glass stage for objects, or rather such as admit of nicely adjusting a talc as occasion may require: the insect to be taken from the water with a camel-hair pencil, and carefully placed on the talc; after which it may be examined by a magnifier of  $\frac{1}{10}$  of an inch focus; but in proceeding to a deeper power, let the talc be turned the upper surface with the insect in the drop of the fluid from the lens, and thereby the lens may approach the object to its proper focus; without this caution the lens would be frequently immersed in the water, and entirely obstruct the sight.

In the adult state, the opacity of the bivalve shell, its external covering, so entirely obscures the internal motion, that nothing, except the filaments it throws from the aperture or opening, is visible by the microscope.

It

It breaks from the egg perfectly formed, but very minute and transparent; this is therefore the best time to discover its structure, and from one in this state we have taken our figure.

By the antennæ it directs its course, as does the *Monoculus Quadricornis*; and like it also it hath two eyes fixed in the shell, but it can completely envelope its head in its bivalve covering; its mouth is beneath, but the numerous filaments it darts forth, causes such a violent motion in the water, that the minuter insects are unresistingly drawn between them, and forced to the mouth.

The motion of its lungs is very visible, as are also the vessels ramifying thence. Its food is carried to, and digested in the deep-coloured tube, or intestine, and the refuse is discharged by a sudden jerk from the extremity of the tube, or anus.

Thus it exists, a life of rapine and destruction, enjoyed at the expense of the lives of thousands; and as the objects of its ravenous disposition are defenceless, so they are the sport of their conqueror: the few moments of intermission its craving appetite grants them, is occupied equally in the spoil, first pressing them to death, and then tossing them undevoured into the fluid.

But should a more powerful insect oppose him, he immediately contracts his parts, and nothing more than the external covering is open to his antagonist's violence, and he will sooner die ignobly than offer the least opposition.

### F I G. II.

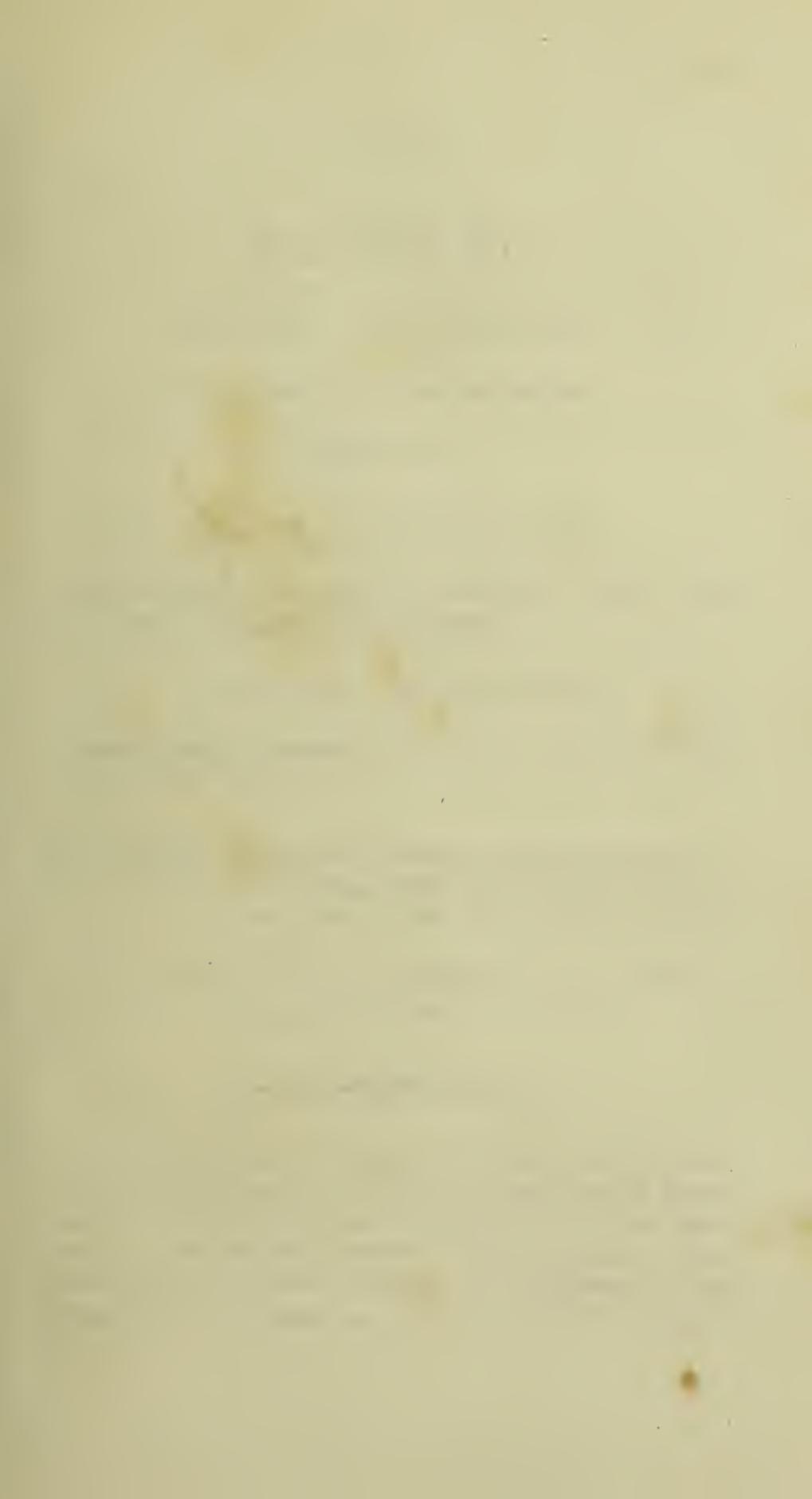
This animalcule is very minute, and appears like a fine membrane without intestines before the microscope; from the appearance of its winged sides, it is supposed to resemble a bird. It is called *Bursaria Hirundinella*.

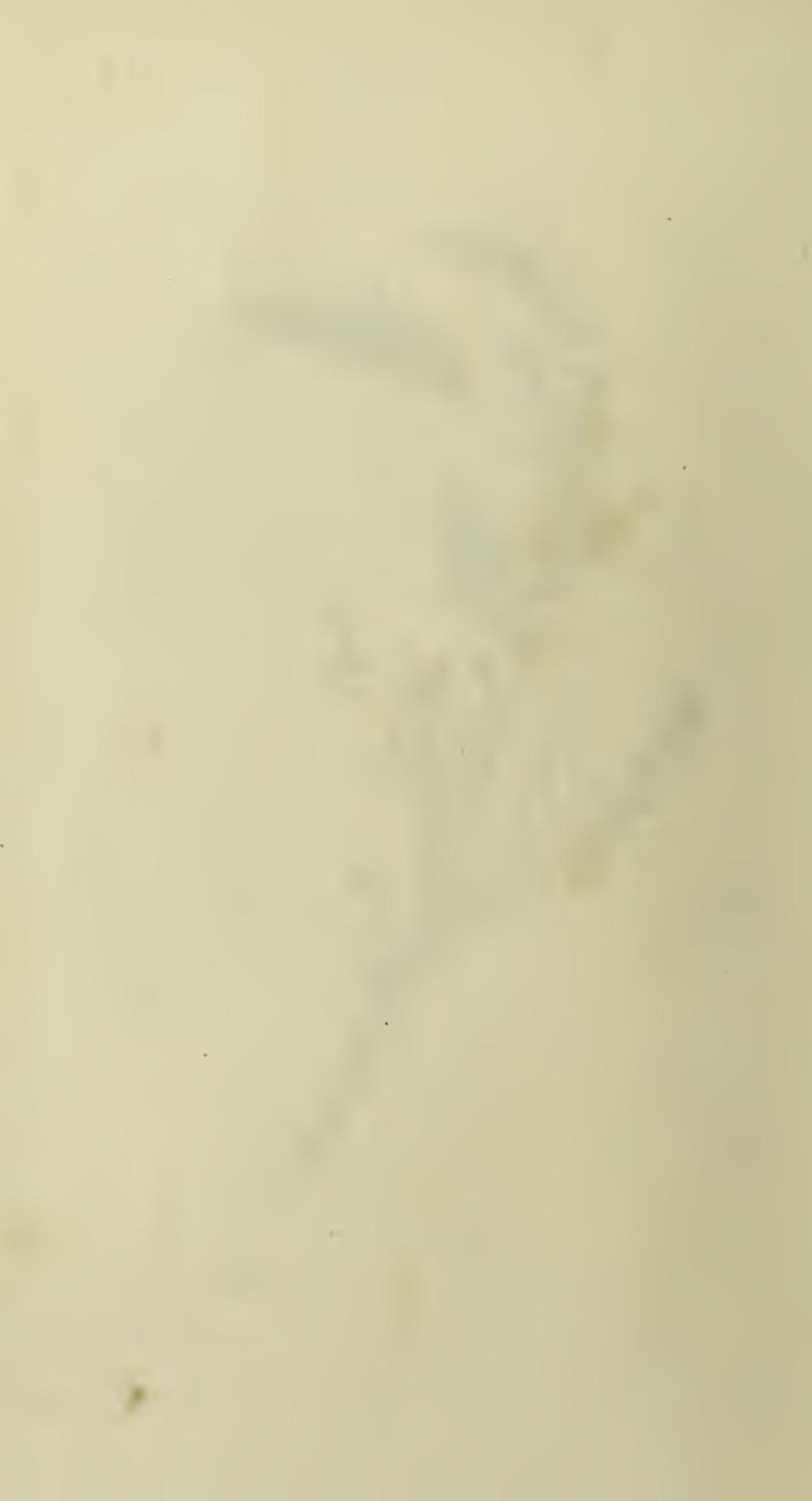
### F I G. III.

The back and side view of an animalcule found in ditch-water on duck-weed, very pellucid, and singularly marked in the intestines; tail moveable, and thereby it directs its course,









## PLATE VI.

## SPHINX FILIPENDULÆ.

SIX SPOT BURNET HAWK-MOTH.

LEPIDOPTERA.

## GENERIC CHARACTER.

Antennæ thickest in the middle. Tongue usually exserted. Palpi two, reflected. Wings when at rest deflected.

## SPECIFIC CHARACTER.

Anterior wings cyaneous-green, with six red spots: posterior wings red with a blue border.

**SPHINX FILIPENDULÆ:** alis primoribus cyaneis: punctis sex rubris, posterioribus rubris: margine cyaneo. *Linn. Fn. Suec.* 1097.—*Gmel. Linn. Syst. Nat.* 2290. *Sp. 34.*

**ZYGÆNA FILIPENDULÆ:** *Fabr. Ent. Syst. T. 3. p. 1. 386. Sp. 1.* *Deger. Inf. 7. p. 591. n. 1. t. 4 f. 1.*

We have in England two species of the *Sphinx* tribe, (*Zygæna* of *Fabricius*) that are known by the trivial appellation of *Burnets*, namely, the *five-spot Burnet*, and the *six-spot Burnet*. These are not varieties, as they have been sometimes considered; they are evidently distinct species; the former *Zygæna Loti* of *Fabricius*, the latter *Sphinx Filipendulae* of *Linnaeus*. There is a variety of *Filipendulae*

found in some parts of the continent, in which the abdomen is marked with a single rufous belt, but this kind has not, to our knowledge, been discovered in this country : Esper gives it under the name of *Sphinx Peucedani*, Gmelin deems it nothing more than a variety of *Filipendulæ*  $\beta$ .

The six spot Burnet *Sphinx* is taken pretty frequently in the neighbourhood of London, where the other is rarely found. In some parts of Bedfordshire the five-spot Burnet is very common.

As all lepidopterous insects are liable to some trifling variations in the colours and markings of their wings from accidental circumstances, so specimens of *Sphinx Filipendulæ* have been taken with the two spots near the base very closely united; insomuch as to appear like a single spot, and hence arose some doubt as to the existence of any other five spot Burnet. If, however, we compare this variety with the true five spot Burnet, a striking difference must be perceived. The latter is smaller, the blue border of the inferior wings is deeper, and the spot of red, which in the six spot Burnet is situated nearest to the apex of the superior wing is wanting.

The larva of the present species feeds on the *Genista Anglica*, on the *Ulex Europæus*, and *Spirea Filipendula*, from the latter of which its Linnæan name is derived.









## PLATE VII.

## CHRYYSIS IGNITA.

## COMMON GOLDEN WASP.

## HYMENOPTERA.

Wings four, generally membranous. Tail of the females armed with a sting.

## GENERIC CHARACTER.

Mouth horny and advanced : jaw linear, much longer than the lip, emarginate, and membranaceous at the tip : no tongue : Palpi four, projecting, unequal and filiform. Antennæ short, filiform, of twelve joints, the first of which is longest. Body golden, shining, and glossy ; abdomen arched beneath with a scale on each side : tail usually dentated : sting partly exerted. Wings flat.

## SPECIFIC CHARACTER

AND

## SYNONYMS.

Glabrous, shining, thorax green, abdomen golden, with four teeth at the extremity.

CHRYYSIS IGNITA: glabra nitida, thorace viridi abdomine aureo : apice quadridentato. *Fn. Suec.* 1665.—*Gmel. Lim. Syst.* 2745. *Sp.* 1.

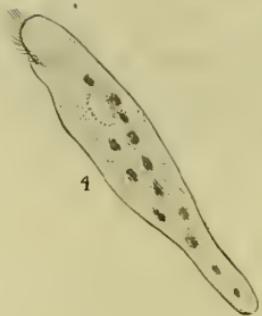
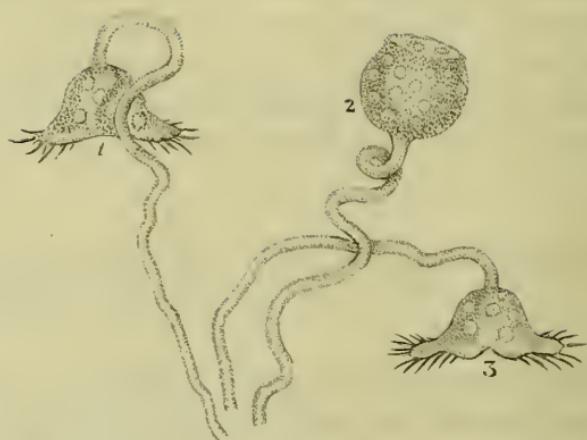
## P L A T E VII.

Exotic Insects, or at least those of the East, or West Indies, for the effulgence and beauty of their colouring in general, claim a superiority over the natives of this climate ; but the appearance of this Chrysis before the speculum of an opake microscope, may vie with many of the most favourite foreigne s hitherto discovered ; the richness of changeable colours blending into each other, according to the variations of the light reflected on the surface, is such that we freely confess our inability, or even the inability of art, to equal ; it though we trust our figure will give some idea of the delightful appearance of the original.

The Fly of the natural size is given on the foreground, the magnified figure above.

It commonly constructs its habitation in the chinks of old walls, or decayed trees, but prefers a situation near the entrance of woods, where it may reside in silent security. If attacked by any Insect of equal size, it is generally victorious, for such is the amazing strength of its almost impenetrable coat, that it will encounter the spider without much apprehension of danger ; and as its strength protects it from many injuries which Insects with tender bodies are exposed to ; the species multiplies, and is not uncommon in several parts of the country. It rarely appears from its retreat until the middle of the day. Not unfrequent among fruit-trees in gardens in hot weather, when the sun shines bright.









## PLATE VIII.

## VORTICELLA LUNARIS.

## GENERIC CHARACTER.

A worm capable of contracting or extending itself, naked, with rotatory cilia.

## SPECIFIC CHARACTER.

Simple, hemispherical, with a twisted pedicle.

---

" The small head of this animalcule is crater-form, the margin  
 " of the orifice protuberant, ciliated on both sides, the hairs undula-  
 " ting, the pedicle eight or ten times the length of the body. As  
 " often as the mouth is opened, the pedicle extends itself; when it  
 " is shut, this is twisted up spirally, and their motions are often reite-  
 " rated in a short space.

" FIG. 1. the head, expanded.—FIG. 2. when shut.—FIG. 3.  
 " the undulated edge."

Müller. *Ani. Inf.*—Adams's *Essays on the Microscope.*

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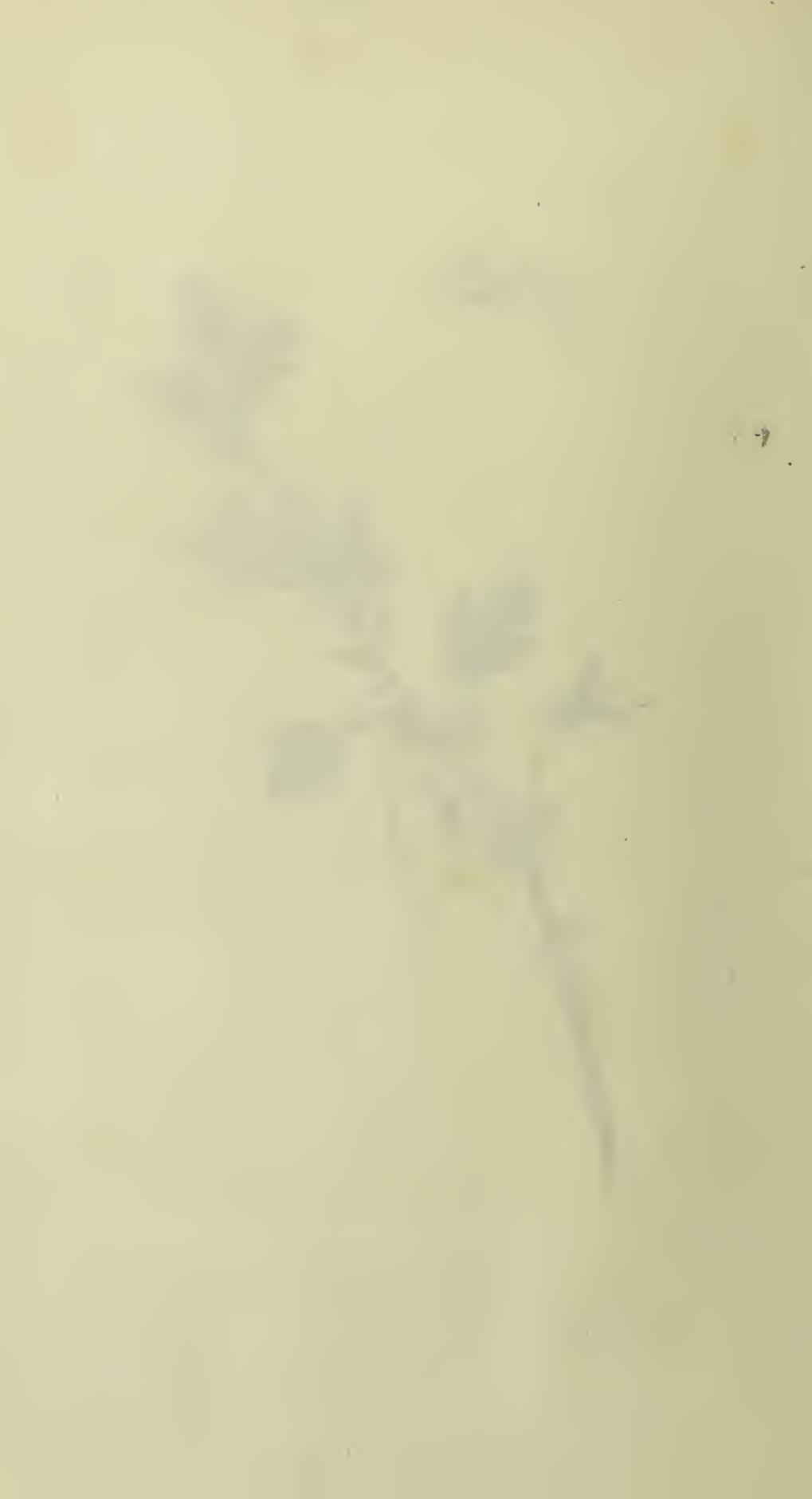
FIG. 4. found in infusions of hay, and is called *Trichoda Uvula*.











## PLATE IX.

## PHALÆNA PADELLA.

SMALL ERMINE MOTH.

LEPIDOPTERA.

## GENERIC CHARACTER.

Antennæ taper from the base. Wings in general deflected when at rest.

## SPECIFIC CHARACTER.

First wings lead colour, with about twenty black dots : second ones brown.

PHALÆNA (*Tinea*) PADELLA : alis primoribus lividis : punctis 20 nigris posterioribus fuscis. *Linn. Fn. Suec.* 1364.  
—*Gmel. Linn. Syst. Nat.* 2586. *Sp.* 351.

---

Phalæna Padella feeds on the white-thorn, black-thorn, and on fruit trees. In May the caterpillars are hatched, and as they live in societies of hundreds, or even thousands, by their united industry they spin a web spacious enough to contain the family, and therein they assume their several forms ; early in June they become chrysalides, and in about fourteen days after that change the moths appear.

The caterpillars of the *Phalæna Padella* and *Evonymella* are almost ever found in the same society, and many circumstances have been advanced

## PLATE IX.

advanced to prove them either varieties of each other, or different sexes of the same species. Linnæus considered them as distinct kinds. They differ in colour in the larva state, that of one being a light yellow brown, and of the other dark brown inclining to black. The superior wings of *Evonymella* are less of a lead colour than those of *T. Padella*, and are marked with a greater number of black dots; the latter, according to Linnæus, should have only twenty of these dots on the wings, the other fifty; but this character is liable to some little variation, as we have frequently had an opportunity of observing, in specimens of both insects. *Phalæna (Tinea) Evonymella* is given in another part of the work.









## PLATE X.

PHALÆNA AURIFLUA.

YELLOW TAIL MOTH.

LEPIDOPTERA.

## GENERIC CHARACTER.

Antennæ taper from the base: wings in general deflected when at rest. Fly by night.

## SPECIFIC CHARACTER

AND

## SYNONYMS.

White; extremity of the abdomen yellow.

BOMBYX AURIFLUA: alis albis: primoribus subtus costa fusca  
ano barbato luteo. *Fabr. Mant. Inf.* 2. p. 125.  
*n.* 145.

PHALÆNA (*Bombyx*) CHRYSORRHœA. *Linn. Syst. Nat.*

Linnæus confounded the Yellow Tail Moth, with another kind known among collectors of English Insects by the name of the Brown Tail Moth; an insect which it may be recollectet appeared in such prodigious numbers in the year 1780, as to spread the utmost consternation throughout the vicinity of the Metropolis; the credulous believing them to be the certain prelude of a famine:—The larvæ of

this last mentioned insect were collected during that period, at the expense of the respective parishes where they appeared most numerous, and were publicly burnt by order of the magistrates.—The Yellow Tail Moth is allied in some degree to the Brown Tail Moth, though evidently distinct.

The Yellow Tail Moth is found in the month of July, feeding on the white-thorn, fallow, apple, and some other fruit trees. About the latter end of the same month, it spins a web of tough texture against the branches of trees, in which it changes to the pupa state, and the Fly comes forth in August.









## PLATE XI.

ACARUS COLEOPTRATORUM.

BEETLE-TICK.

APTERA.

No wings.

GENERIC CHARACTER.

Legs eight. Eyes two, lateral. Tentacula two, jointed.

SPECIFIC CHARACTER.

Tawny. Anus whitish.

*Syst. Ent.* 814. 24. *Linn. Syst. Nat.* 2. 1026. 27. *Fn. Sv.* 1978.

This Tick is one of those detestable race of animals whose minuteness secures it from danger, while it draws nutriment from the blood, and frequently from the vitals of larger insects. Every animal is tormented by those cruel and blood-thirsty beings, varying in size, in shape, and in colour, but whether they be distinguished by the name of lice, bugs, fleas, or mites, they fall under one point of view, when considered as a pest to the societies of other animals. In a scientific arrangement they must of course be regarded as generically different.

Beetles are in general infested and severely injured by those vermin. I found about a month since one of the *Scarabaeus Stercorarius*, Com-

*mon Dor*, or *Clock*, almost devoured alive by them, little except his shell remaining; yet, in this state, it lived several days. There were a number of small brown bags affixed by pedicles to its breast, thighs, and even feet; the microscope discovered those to contain each an embryo, and the pedicle, seemed to answer the part of an umbilical chord, to extract nourishment from the living creature. I perceived on further inspection their base penetrated the shell, or entered the apertures.

FIG. 1. Natural size of the Ticket and Embryo.

FIG. 2. The upper side, and Fig. 3. under side, magnified.

GRADUAL, from these what numerous kinds descend,  
Evading even the microscopic eye!  
All Nature flocks with life; one wond'rous mass  
Of Animals or Atoms organized,  
Waiting the vital breath, when PARENT HEAVEN  
Shall bid his Spirit blow. ——————  
—————

————— These, conceal'd  
By the kind art of forming HEAVEN, escape  
The groffer eye of man: for, if the worlds  
In worlds inclos'd, should on his senses burst,  
From cates ambrosial, and the nectar'd bowl  
He would abhorrent turn: and in dead night  
When silence sleeps o'er all, be stunn'd with noise.

THOMSON'S SEASONS





## PLATE XII.

## CICINDELA CAMPESTRIS.

## SPARKLER.

## GENERIC CHARACTER.

Antennæ setaceous. Palpi six, filiform; jaws prominent, with many teeth. Eyes prominent. Thorax roundish, and margined.

## SPECIFIC CHARACTER.

Green: five white spots on the wing-cases.

CICINDELA CAMPESTRIS: *viridis*, *elytris punctis quinque albis.*  
*Linn. Fn. Suec. 746.—Gmel. Syst. Nat. 1920. Sp. 1.*

---

Those beautiful Insects vary something in size and colour, the spots on the elytra are generally white, but are often found with spots of yellow; they fly or run quick, are carnivorous, and live in dry sandy places. In the spring its larva is found, which resembles a long, soft, whitish worm, with six legs and a brown scaly head; it perforates the sand perpendicularly, and rests near the surface to ensnare smaller insects.

It is very difficult, if at all possible, to breed those insects and observe their metamorphoses; we have tried various methods, but have not yet been so fortunate as to succeed.











## PLATE XIII.

LUCANUS CÉRVUS.

STAG BEETLE.

COLEOPTERA.

## GENERIC CHARACTER.

Antennæ clavated, compressed, pectinato-fissile. Maxillæ extended so as to resemble horns. Five joints in each foot.

## SPECIFIC CHARACTER.

Head and Thorax black. Shells dark brown. Horns resembling those of a stag, forked at the end, a small branch near the middle on the inside, moveable. Shells plain.

The Stag-Beetle is the largest coleopterous insect we possess, but its size is insignificant, when compared with those of the same kind that inhabit hot countries or woodlands, as instanced in the *Scarabaeus Hercules*, &c.

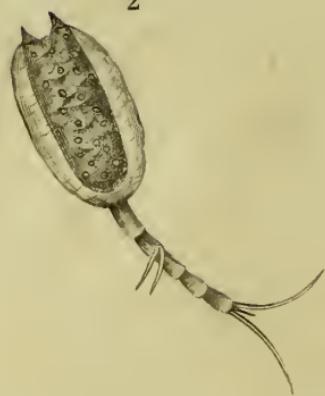
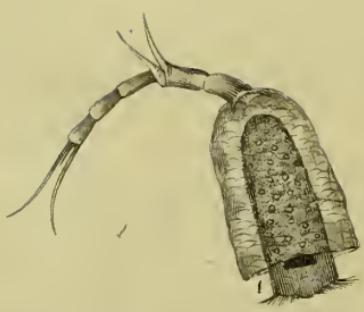
It is sufficiently distinguished in this country by the moveable maxillæ, or jaws, that project from the head; they are of a dark red colour, and though brighter in some specimens, are rarely of the beautiful coral appearance *Barbut* and other authors have described.

Coleopterous insects in general are endowed with amazing strength, and their arms are equally serviceable for the assault or defence. The antlers of this Beetle are carefully to be avoided by such as attempt to deprive it of liberty; with them it strips off the bark of oak trees, and attaches itself firmly to the trunk, thence extracting the liquor that oozes with its tongue.

They are plentiful in June and July, in Kent and Essex, and in many other parts of Britain.

The females are known by their maxillæ being much shorter than those of the males; they deposit their eggs under the bark of old trees, either oak or ash, and the food of the larvæ, or grubs, is the internal substance of the trunk, first reduced to a fine powder; they undergo transformation in this cell, and force a passage through the bark when perfect beetles.









## PLATE XIV.

## TRICHODA POCILLUM.

## TRICHODA.

An invisible, pellucid, hairy worm.

## SPECIFIC CHARACTER.

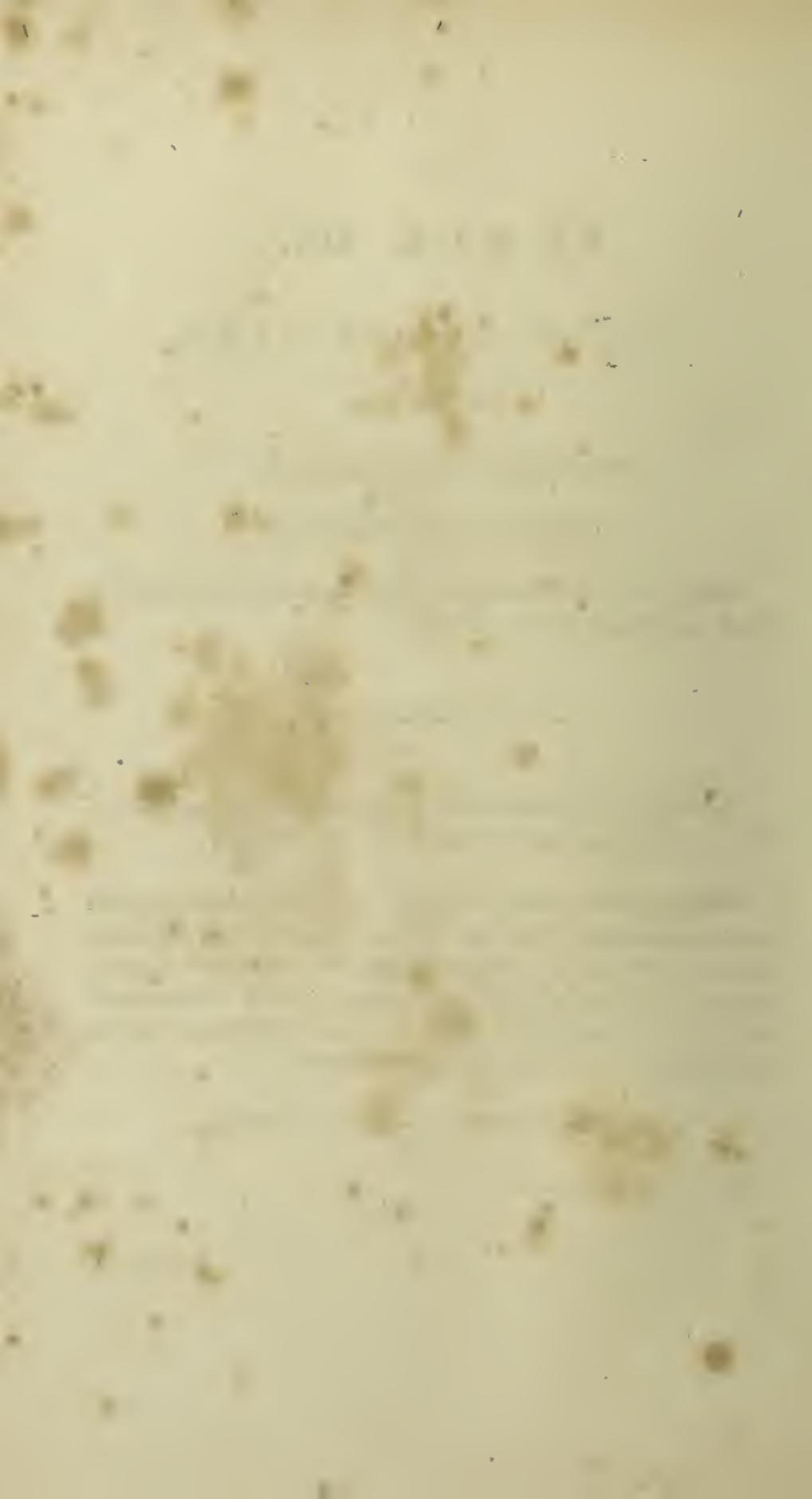
Oblong trichoda, the fore-part truncated and hairy, the tail articulated, and divided into two bristles.

This invisible animalculum is common in marshy places, particularly in the swamps near the banks of the river Thames.

When magnified, the body is pellucid, and appears like two separate bodies, one enclosing the other; the interior part is filled with molecules, and the exterior is membranaceous: they are capable of extension or dilation, and of folding in various directions. At the extremity of the interior part is a muscular orbicular membrane, which is opened or shut at pleasure, and forms the mouth.

FIG. 1. The interior part protruded with the mouth open.

FIG. 2. The jaws shut.











## P L A T E   X V.

P H A L Æ N A   C A J A.

G R E A T   T Y G E R   M O T H.

L E P I D O P T E R A.

G E N E R I C   C H A R A C T E R.

Antennæ taper from the base: wings in general deflected when at rest. Fly by night.

S P E C I F I C   C H A R A C T E R

A N D

S Y N O N Y M S.

Wings fuscous, intersected with rivulets of white: posterior pair red with black spots.

P H A L Æ N A   C A J A : alis fuscis: rivulis albis, posteris purpureis nigro punctatis. *Linn. Fn.*

*Suec.* 1. *p.* 820. 2. *n.* 1131.

*Fabr. Sp. Inf.* 2. *p.* 198. *n.* 122.

*Gmel. T.* 1. *p.* 5. 2410. *Sp.* 38.

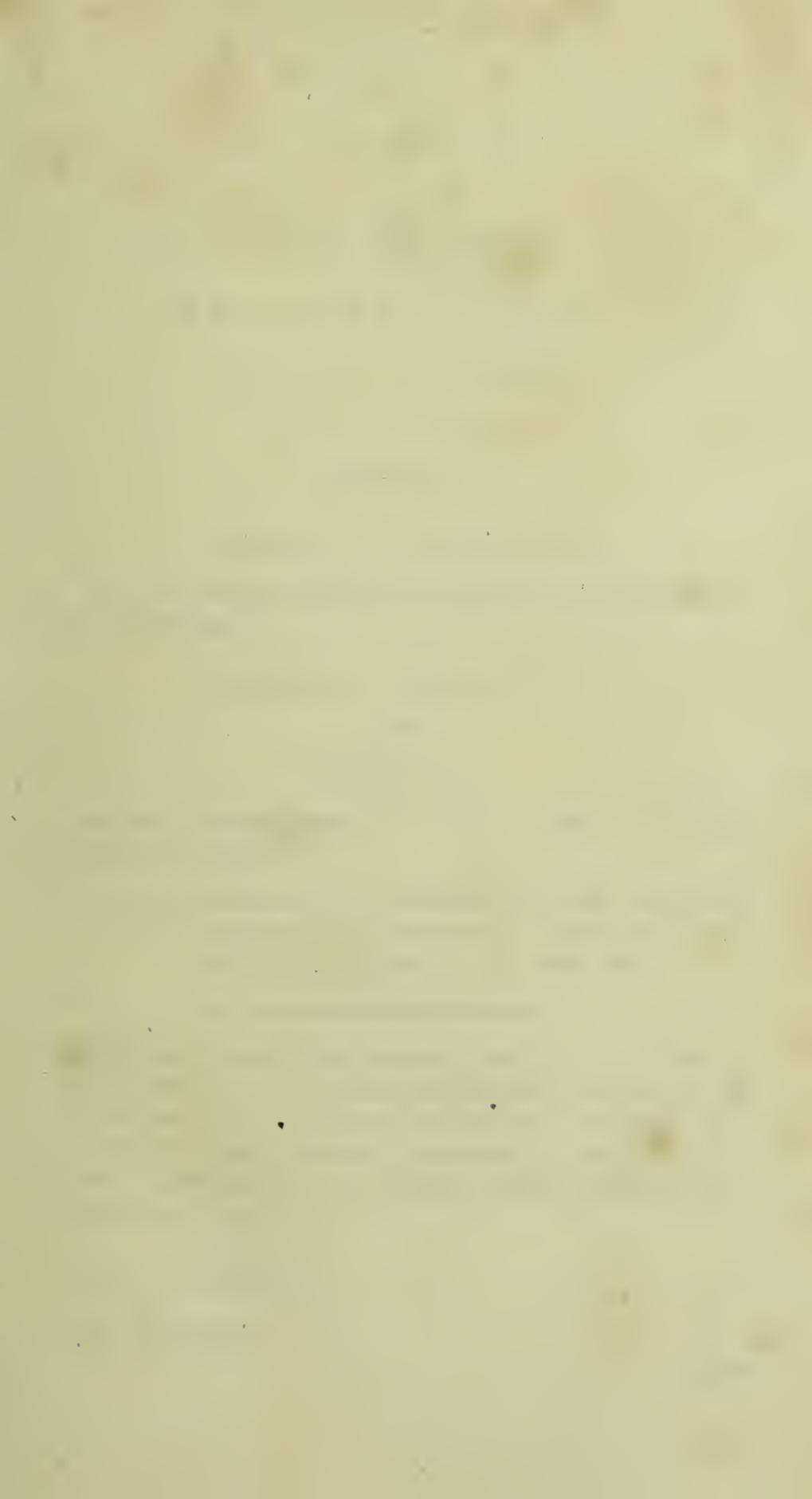
The superior wings in some examples of this species are marked with spots of brown, much smaller in size than those depicted in the present insect: the spots in others are also occasionally larger, and vary in being more or less confluent or united; the rivulet intersecting waves

waves of white or cream colour are more or less conspicuous in different specimens. The lower wings admit likewise of material variation in the number as well as magnitude of the black spots; in having more or less of the blue subocellated space in the center; or in being encircled by a narrow yellow border, an appearance it sometimes, though rather rarely, exhibits.

The Caterpillar is often found in gardens, and feeds on the lettuce, nettle, &c. When apprehensive of danger it rolls itself up like a hedgehog. In May it becomes a pupa, and the latter end of June or early in July the Moth is produced.









## PLATE XVI.

### PHALÆNA ANTIQUA.

WHITE SPOT TUSSOCK MOTH,  
OR

VAPOURER.

LEPIDOPTERA.

### GENERIC CHARACTER.

Antennæ taper from the base: wings in general deflected when at rest. Fly by night.

### SPECIFIC CHARACTER

AND

### SYNONYMS.

Anterior wings ferruginous, with a white lunule at the posterior angle: female apterous.

PHALÆNA ANTIQUA: alis primoribus ferrugineis: lunula alba anguli posterioris: femina aptera. *Linn. Fn. Suec.* 1120. *Gmel. Linn. Syst. Nat. T. 1. p. 5.* 2439. 56.

---

The female Vapourer Moth appears at first sight to resemble an apterous insect; but on inspection will be found to exhibit a pair of wings of very minute size at the base of the thorax; and besides this, the antennæ are alone sufficiently characteristic to determine it an insect of the Phalæna tribe. It creeps in a sluggish manner, and lays an abundance of eggs.

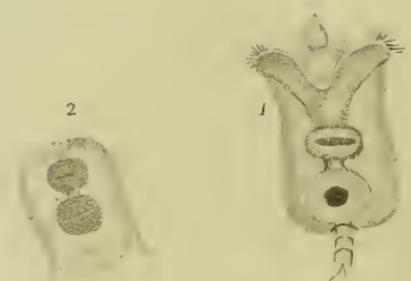
FIG. 1. The female.

FIG. 2. The male.

The

The Caterpillars feed on white thorn, and on fruit trees in general. They have been known to live on the deadly night-shade, and other poisonous plants. The species is found in the Caterpillar state in July, and the Moth in September.









## PLATE XVII.

## VORTICELLA URCEOLARIS.

*GENERIC CHARACTER.*

A small animal, with a vascular cup; the mouth is at one end ciliated, and capable of being contracted; the stem fixed.

*SPECIFIC CHARACTER.*

Single, with a short tail, and toothed mouth.

This Animalcum is but barely perceptible to the naked eye, appearing as a small white speck; the microscope discovers the external covering to be so transparent, that all the motions of the animal within are perfectly distinguishable. It has a double rotatory instrument, which, however, it can conceal or shew at pleasure; and has also power to protrude the head and tail as at FIG. 1. or to contract them within the external coat or covering, as at FIG. 2.—When the animal intends to display its rotatory instrument, it forces its tail through the hole at the extremity of the outer coat, and affixes it to whatever substance is near; but when it swims, it moves its tail backwards and forwards to assist it.

They are found in river, or stagnant, water.

G

FIG.

## F I G. III.

## TRICHODA VERMICULARIS.

*GENERIC CHARACTER.*

An invisible, pellucid, hairy worm.

*SPECIFIC CHARACTER.*

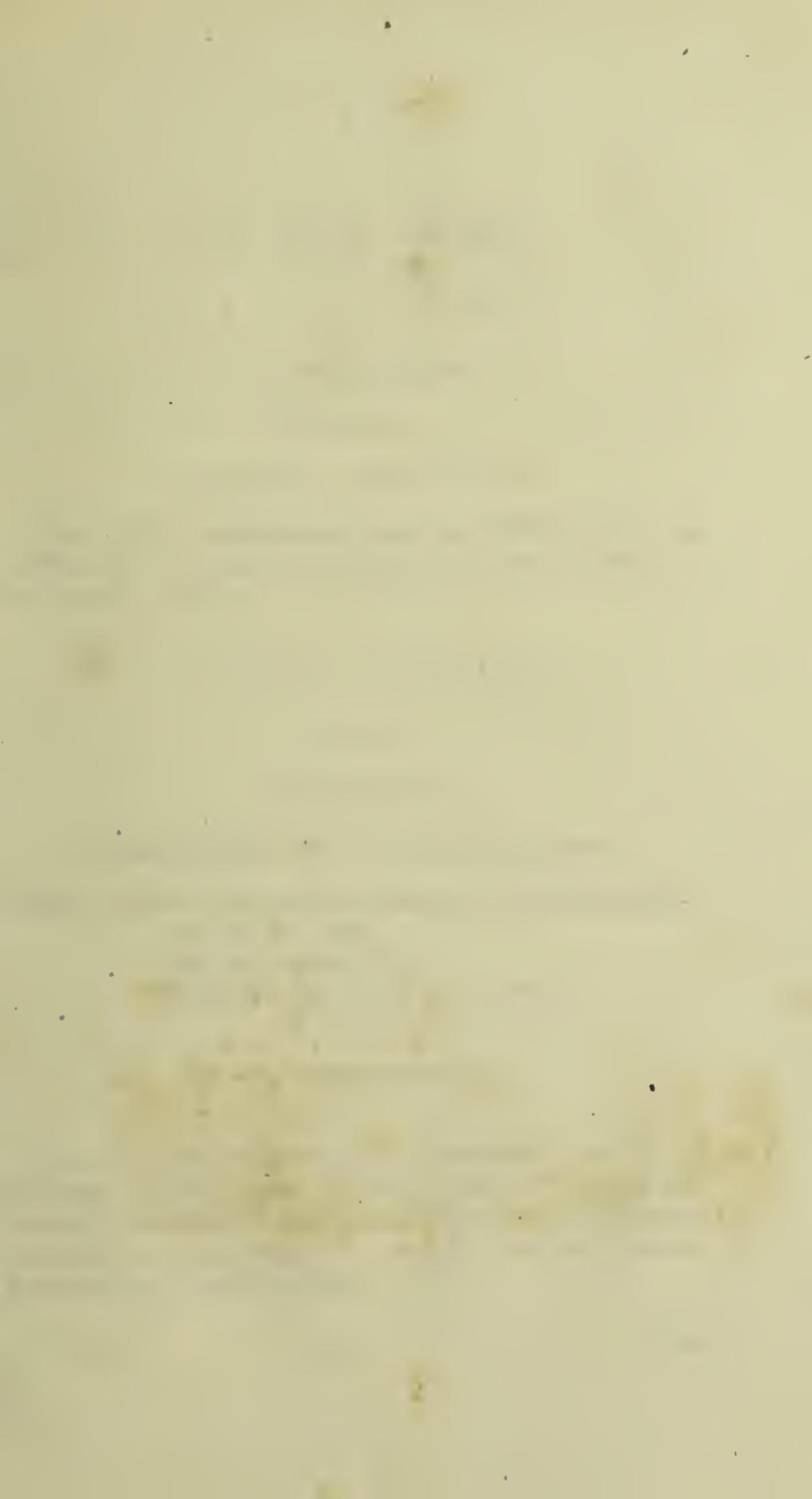
Long cylindrical trichoda, with a short neck, the apex hairy.

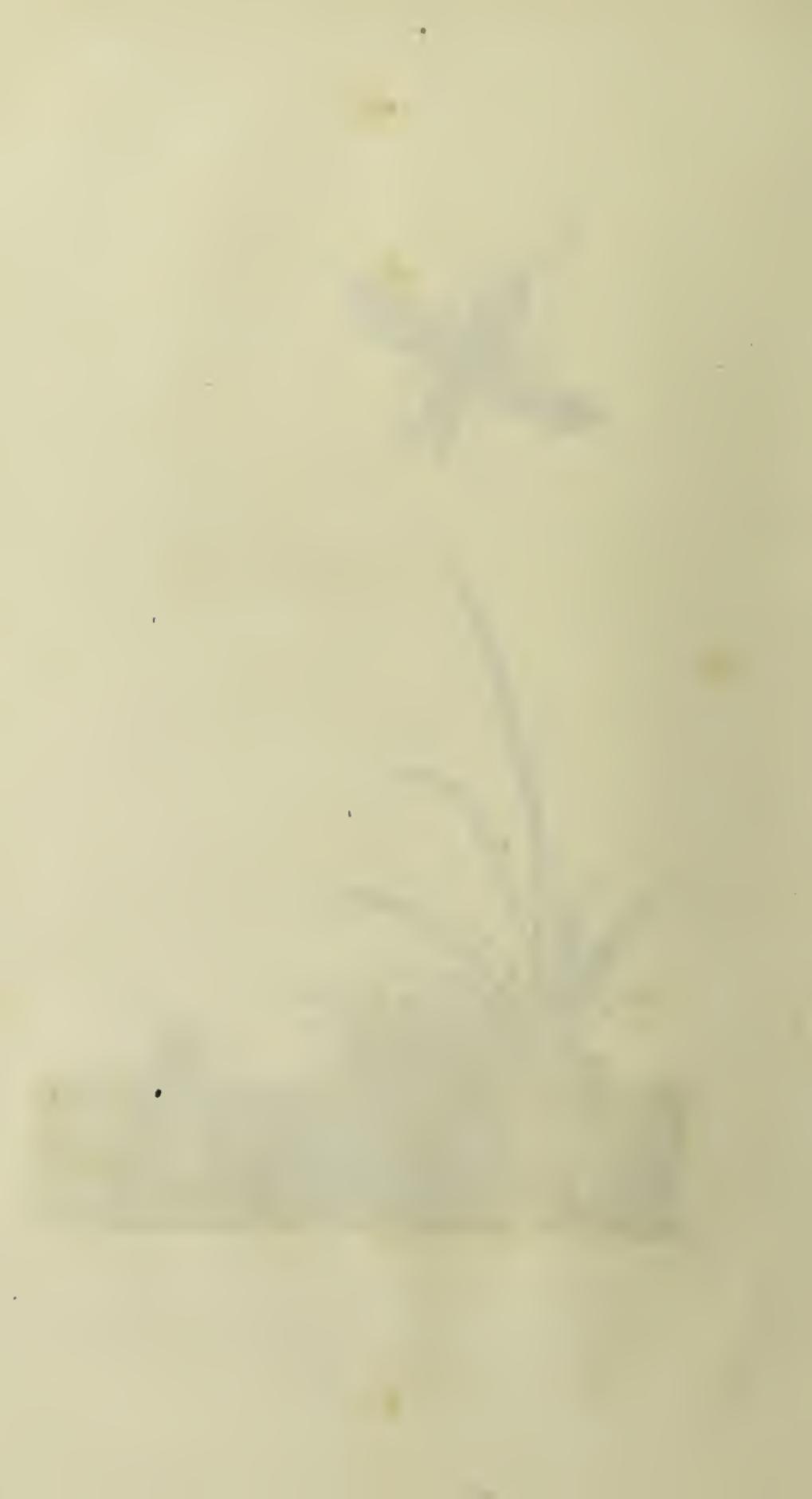
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Is found in river water, and can assume various forms, as shewn in the annexed plate.









## PLATE XVIII.

NEPA CINEREA.

WATER SCORPION.

HEMIPTERA.

GENERIC CHARACTER.

Beak inflected : antennæ short : wings four folded cross wise, the anterior part of the first pair coriaceous : fore legs cheliform, the rest formed for walking.

SPECIFIC CHARACTER

AND

SYNONYMS.

Cinereous : thorax unequal : body oblong and ovate.

NEPA CINEREA : cinerea, thorace inaequali, corpore oblongo ovato.

*Linn. Fn. Suec. 906.**Fabr. Sp. inf. 2. p. 333. n. 5.**Gmel. Linn. Syft. Nat. T. 1. p. 5. 2121. 5.*

There are only three species of this genus common to our waters, the largest of which is much inferior in size to the Nepæ, that abound in the waters of hot countries ; some of which exceed even our Sphinx Atropos in magnitude. They all possess nearly the same habits, and are extremely voracious.

The female deposits her eggs in the hollow stem of the rush, or other aquatic plants, from whence it issues when it attains the larva form, and becomes an active inhabitant of the water, like the perfect insect. From June to September, or later, it occurs in the winged state.

The Nepæ feed on other small aquatic animals, which they seize between their fore feet, and tear in pieces with their sharp rostrum. They fly in the evening in herds, and it is in this manner they remove from one pool to another.









## PLATE XIX.

## CHRYYSIS BIDENTATA.

## HYMENOPTERA.

## GENERIC CHARACTER.

Mouth horny and projecting: lip much shorter than the jaw, which is linear, membranaceous, and emarginate at the tip: no tongue: feelers four, unequal, and filiform: antennæ short and filiform, and consisting of twelve articulations, the first longest: body golden, and polished: abdomen arched beneath, with a scale each side: tail generally toothed: sting pungent and nearly concealed: wings flat.

## SPECIFIC CHARACTER

AND

## SYNONYMS.

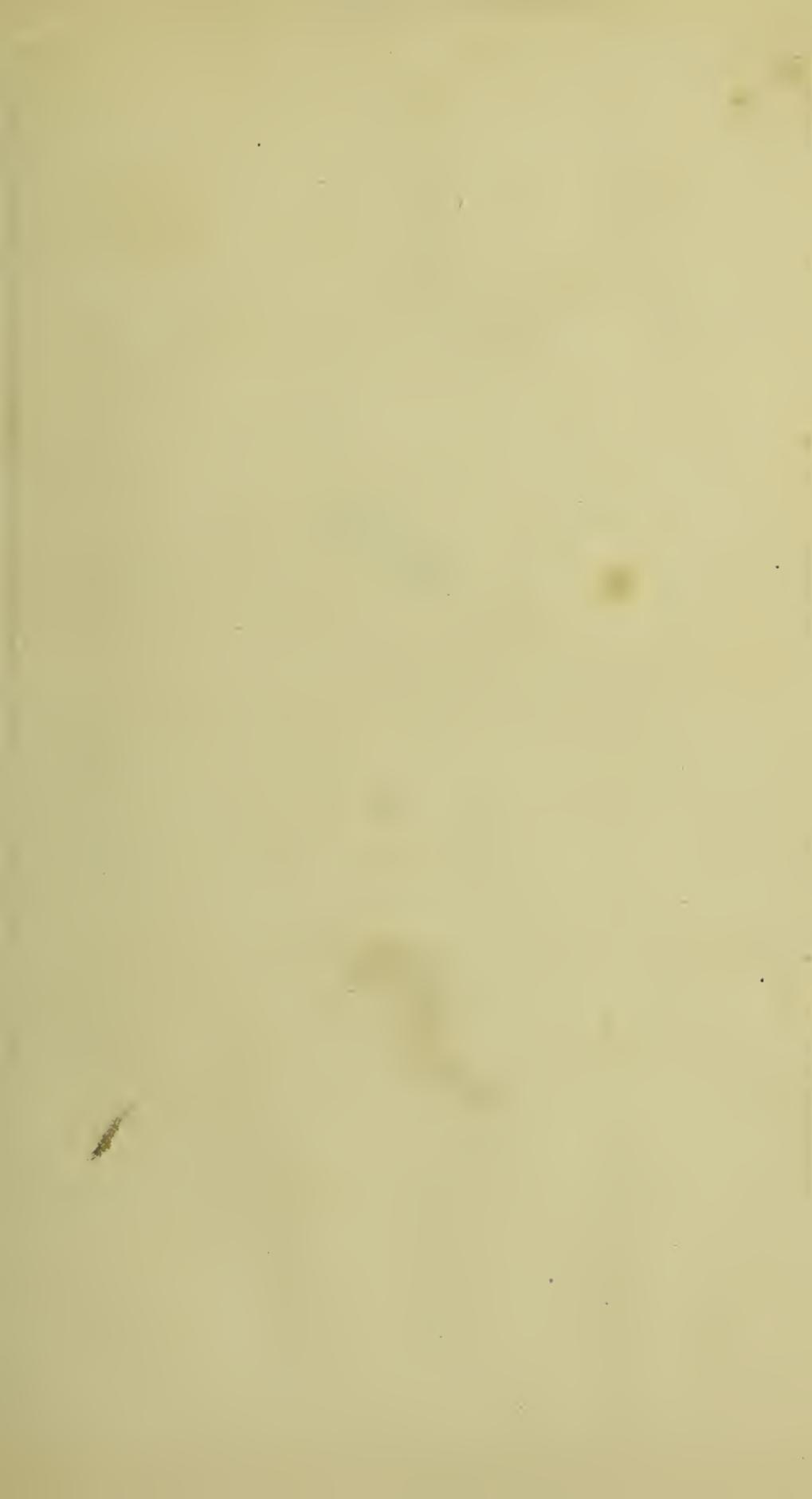
Glabrous, blue: thorax bidentate, and with the two first segments of the abdomen golden.

CHRYYSIS BIDENTATA: glabra, nitida cyanea, thorace bidentato abdominisque segmentis duobus primis aureis. *Fabr. Sp. Inf.* 1. p. 456. n. 9.

The Chrysis bidentata is scarcely so large, and by no means so common as the Chrysis ignita, but is fully equal if not superior in the beauty and richness of its colours to that splendid little insect. The head, and third or extreme segment of the body is blue, changeable

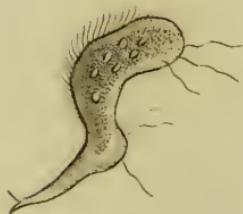
able to green and purple; and the thorax together with the two first segments of the abdomen crimson, with a metallic brilliancy resembling burnished gold; it is also besprinkled with specks of a golden lustre, which renders it a most superb object for the microscope.

This insect is found in May or June, sometimes on fruit-trees, or in dead walls exposed to the mid-day sun, like its analogous species, *C. ignita*.





2







## PLATE XX.

## FIG. I.

## PHALÆNA CHRISTIERNANA.

## LEPIDOPTERA.

## GENERIC CHARACTER.

*Tortrix.*

Antennæ taper from the base : wings in general deflected when at rest. Fly by night.

## SPECIFIC CHARACTER.

Anterior wings yellowish, reticulated with sanguineous veins.

PHALÆNA CHRISTIERNANA: alis primoribus flavissimis: venis sanguineis reticulatis. *Fabr. Sp. Inf. 2. p. 281. n. 33.*

---

We are not at present acquainted with the transformation of this very beautiful little insect; in the Fly state it is known as an uncommon species, and in Britain is extremely rare.

Our specimen was taken at Faversham. The species is sometimes met with in the woods of Darent in Kent in the month of June or July.

## FIG. II.

## HIMANTOPUS LUDIO.

## GENERIC CHARACTER.

A pellucid, invisible, cirrated worm.

## SPECIFIC CHARACTER.

Curled Himantopus; the upper part hairy, the tail extended upwards.









## PLATE XXI.

## PHALÆNA PRUNARIA.

ORANGE MOTH.

LEPIDOPTERA.

## GENERIC CHARACTER.

Antennæ taper from the base: wings in general deflected when at rest. Fly by night.

\* *Geometra*.

## SPECIFIC CHARACTER

AND

## SYNONYMS.

Antennæ pectinated: wings somewhat indented, yellow, powdered with fuscous, and a fuscous lunule in the middle of the anterior ones.

PHALÆNA PRUNARIA: pectinicornis subdentatis luteis fusco pulvulentis: anticis lunula fusca. *Linn. Syst.*

*Nat. 2. 861. 208.—Fn. Suec. 1232.*

*Fabr. Ent. Syst. T. 3. p. 2. 141. 43.*

*Wien Verz. 104. 17.*

*Schaeff Icon. tab. 17. fig. 2. 3.*

*Albin. Ins. 42. tab. 69.*

Variable in colour from yellow to deep orange, and the spot in the middle of the anterior wings sometimes much larger than usual.

The

The larva is yellowish brown, with two spines on the anterior part and two behind. They feed on fruit-trees and on the thorn; the Chrysalis is commonly found enveloped in a web, and rolled up in a decayed leaf, in the month of June; and in July the Moth appears.









## PLATE XXII.

TIPULA PLUMOSA.

PLUMOSE, OR SEA TIPULA.

DIPTERA.

## GENERIC CHARACTER.

Mouth with a very short membranaceous proboscis, the back grooved and receiving a bristle: beak short and without a sheath: feelers two, incurved, filiform and longer than the head: antennæ filiform in general.

## SPECIFIC CHARACTER

AND

## SYNONYMS.

F Thorax greenish: wings white glossed with prismatic hues, and a brown dot: antennæ feathered.

TIPULA PLUMOSA: thorace virescente, alis albis: puncto fusco,  
antennis plumosis. *Fabr. Sp. Inf. 2.* p. 406.  
*n. 31.—Mant. Inf. 2.* p. 324. *n. 37.*

*Tipula thorace virescente, alis hyalinis puncto nigro.* *Linn. Syst.*  
*Nat. xii. 2.* p. 974. *n. 26.—Fn. Suec.* 1758.

Is found in the month of April in marshy places, and has frequently been mistaken for the common gnat.

PLATE











## PLATE XXIII.

## SILPHA VESPILLO.

DOUBLE ORANGE-BAND SILPHA,

CARRION OR BEETLE.

COLEOPTERA.

## GENERIC CHARACTER.

Antennæ clavated, the club perfoliated : wing-cases margined : head prominent : thorax somewhat flattened and margined.

## SPECIFIC CHARACTER

AND

SYNONYMS.

Oblong, black : shield of the head orbicular and unequal : wing-cases with two sinuate orange or fuscous bands, and the tip of the antennæ fuscous.

**SILPHA VESPILLO** : oblonga altra, clypeo orbiculato inæquali, elytris fascia dupli ferruginea. *Linn. Fn. Suec.* 444.—*Gmel. Syst. Nat.* 1616. 2.

*Nicrophorus ater*, elytris fascia dupli ferruginea. *Fabr. Sp. Inf.* 1. p. 84. n. 2.

*Dermestes Vespillo*. *Scop. Ent. Carn.* 33.

This

This species, like most other coleopterous insects, delights in filth, and is rarely found except in the dung or dead bodies of larger animals, whose decaying entrails they voraciously devour. They feed on the larvæ of insects likewise; they secrete themselves beneath the surface of the ground, and not unfrequently destroy each other.

The grubs of *Silpha Vesillo* are secreted in holes perforated in the earth by the female, and are to be found in following the track of the plough-share, by which they are turned up in abundance: after remaining for some time in the grub state in the earth they assume the pupa form, and lastly appear in the winged state in June or July. About mid-day, when the sun shines, they are found on dry banks, and in path-ways. They fly well by means of the filmy or transparent wings which are concealed under the short wing-cases when the insect is at rest. The male is rather smaller than the female, and the orange belts are of a deeper hue: though both male and female vary a little in brightness of colour when alive; they also fade, in some degree after death, whatever may be the care of the collector to prevent it.









## PLATE XXIV.

## LIBELLULA DEPRESSA.

## DEPRESSED DRAGON FLY.

## NEUROPTERA.

## GENERIC CHARACTER.

Mouth armed with jaws, more than two in number; lip trifid: antennæ very thin, filiform, and shorter than the thorax: wings expanded: tail in the male furnished with a forked process.

## SPECIFIC CHARACTER.

All the wings blackish at the base: abdomen depressed, and yellowish at the sides, the middle in the male blue, in the female reddish brown.

**LIBELLULA DEPRESSA:** alis omnibus basi nigricantibus, abdomine depresso lateribus flavicantè. *Fabr. Sp. Inf.* 1. p. 519. n. 2.—*Mant. Inf.* 1. p. 236. n. 2.—*Gmel. Syst. Nat.* 2621. 5.

---

All the species of Libellulæ, but particularly the larger kinds, are considered by many as objects of terror, and the vulgar denomination of *Horse Stingers*, the name by which they are generally known, contributes not a little to the prejudice against them. They have

## P L A T E XXIV.

have not, however, as is commonly believed, any other power over that noble and useful animal than to alarm him, by fluttering round him when he seeks the water to refresh himself in hot or sultry weather. Among the insect race the *Libellulæ* are indeed mischievous, and seem to occupy among them the same station as the vulture tribe among the feathered part of the creation : they attack all with ferocity, and destroy more for the sake of sport than the voracity of their appetites can possibly require as food.

The Fly appears on the wing in May and June, in almost every marshy situation : the female lays her eggs near the roots of osiers on the banks of ditches, or sinks them into the stalks of rushes standing in the water: they hatch, and an ugly apterous insect, of a brown colour, comes forth: it has a long body like the Fly, six legs, a forked head, a sharp spine at the extremity of the abdomen, and a row of spines on each side, one at every joint. This creature immediately on being hatched plunges into the water, and proceeds to devour such of the inhabitants or their eggs as come within its reach, and it continues this life of depredation, through the pupa as well as larva state. Insects of this kind are to be caught by means of a small hand net ; in the winged state they are taken with difficulty, as they fly, or rather dart, with a degree of velocity that renders all pursuit fruitless, should they evade the first attempt of the collector to capture them.









## PLATE XXV.

## SPHINX APIFORMIS.

## BEE HORNET-SPHINX.

## GENERIC CHARACTER.

Antennæ somewhat prism-form, tapering at each end: tongue mostly exserted: feelers two, reflexed: wings deflected.

\* *SESTIA* *Fabr.*

## SPECIFIC CHARACTER

AND

## SYNONYMS.

Wings transparent; abdomen yellow, with black incisures, and two blackish belts above: thorax black, with two yellow spots.

**SPHINX APIFORMIS:** alis fenestratis, abdomine flavo: incisuris atris thorace nigro: maculis duabus flavis. *Fabr.*  
*Sp. Inf.* 2. p. 156. n. 15.—*Mant. Inf.* 2. p. 99.  
*n. 12.* *Linn. Transf.* 3. tab. 1. fig. 1. 2.

---

The larva of *Sphinx Apiformis* is of the kind denominated by Collectors from its manner of life "an internal feeder," subsisting on the inner substance of the poplar tree, the only one in which the female is said to deposit her eggs, and from whence the larva cannot

K

be

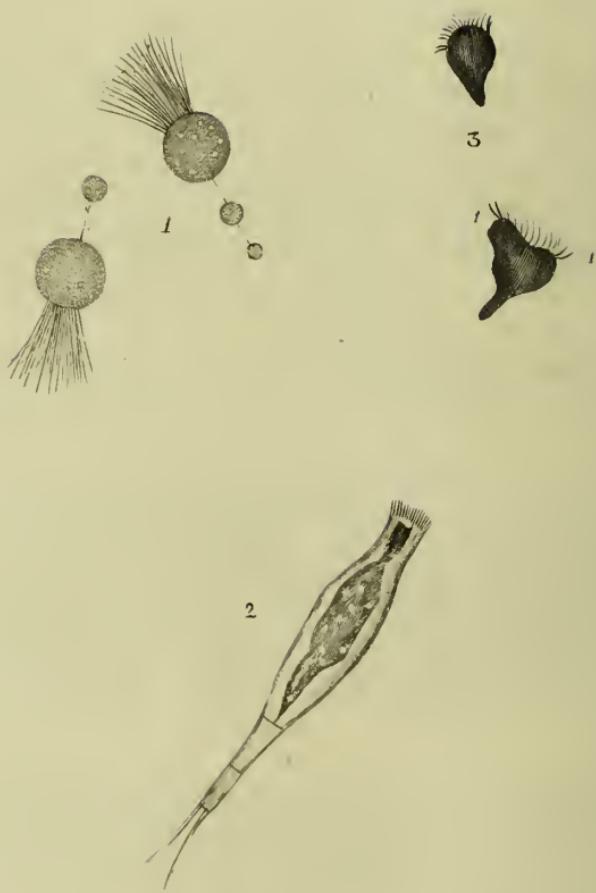
be extracted except by making an incision through the outer bark. The larva is of a pale yellowish colour, with the head yellow. In June, early in the morning, or in the evening, the pupa is seen issuing through the bark from a perforation in the trunk, which the larva had previously formed at the distance of six or eight inches, or even more from the bottom of its recess. For the purpose of facilitating the passage of this pupa to the aperture of the cell Nature has furnished every segment with a double row of sharp teeth, or spines, by means of which it firmly attaches itself to the sides of the cavity, and by repeated exertion gradually attains the entrance of its prison. When thus far extricated, the anterior part of the pupa is protruded, while the lower, beset with little teeth, remains in the cavity; in this posture the upper part bursts asunder with violence, and the perfect insect rushes forth, leaving the shell of the pupa sticking at the entrance of its cell.

This is a curious insect, and as it has been observed is rarely found except in Essex.

There is another insect of the *Sesia*, or transparent winged tribe of *Sphinges*, that differs from the present subject only in a few particulars, yet may easily be distinguished by a crescent of yellow on the fore-part of the thorax, and is thence entitled the *Lunar Hornet Sphinx*. A drawing of the latter, with the larva, has been presented to the Linnæan Society; and will be also found in a future part of this work.

The insect now under consideration is arranged in many cabinets under the title of *Sphinx Vespiiformis*; but it is not the *Sphinx Vespiiformis* of Linnæus; the latter, in the possession of Dr. Smith, we have seen, and it scarcely exceeds half the size of the present subject.









## P L A T E   XXVI.

---

### F I G. I.

#### TRICHODA COMETA.

##### *GENERIC CHARACTER.*

An invisible, pellucid, hairy Worm.

##### *SPECIFIC CHARACTER.*

Spherical, the fore part hairy, with an appendant globule.

---

### F I G. II.

#### TRICHODA LONGICAUDĀ.

##### *SPECIFIC CHARACTER.*

Cylindrical, the first part truncated, and set with hairs. The tail long, with two joints, and terminated by two bristles.

---

### F I G. III.

#### VORTICELLA TROCHIFORMIS NIGRA.

##### *GENERIC CHARACTER.*

A Worm, capable of contracting or extending itself, naked, with rotatory cilia.

##### *SPECIFIC CHARACTER.*

Top-shaped black vorticella.

This species of Vorticella, without the assistance of a microscope, resembles so many small black specks, swimming on the water, particularly in meadows which are inundated. They are constantly in motion; and two small white hooks are perceptible by glasses at 1—1; by the help of those it is supposed to swim, or they may inclose some rotatory organ. The insect is opaque.









## PLATE XXVII.

## LEPTURA ARIETIS.

## COMMON WASP BEETLE.

## COLEOPTERA.

## GENERIC CHARACTER.

Antennæ setaceous: feelers four, and filiform: wing-cases tapering towards the tip: thorax slender and rounded.

## SPECIFIC CHARACTER

AND

## SYNONYMS.

Thorax black: wing-cases black, with yellow bands: the second curved upwards: legs ferruginous.

**LEPTURA ARIETIS:** *Linn. Syst. xii. 2. p. 640. n. 23.*

*Leptura nigra, &c.* *Linn. Fn. Suec. 1. n. 507.—Geoffr. Inf. par. 1. p. 214. n. 11.*

*Cerambyx quadrifasciatus.* *Degeer. Inf. 5. p. 81. n. 18.*

*Callidium Arietis.* *Fabr. Sp. Inf. 1. p. 242. n. 36.—Mant. Inf. 1. p. 155. n. 51.*

**STENOCORUS ARIETIS.** *Scop. Ann. Hist. Nat. 5. p. 96. n. 57.*

This

This species is sometimes found on aquatic plants: they are exceedingly numerous in Kent, in the pease and bean fields, during the month of May: we have also found them on currant bushes, and not unfrequently on the fern. They fly well by means of their wings, which are concealed beneath the wing-cases.

*PLATE XXVII.*

*LEPTOCERA FUSCA*

*COLLECTED*

*AT CANTERBURY*

*IN MAY AND JUNE 1812.*

*PLATE XXVII.*

*MAY 1812.*









## PLATE XXVIII.

## CHRYSOMELA ASPARAGI.

## COLEOPTERA.

## GENERIC CHARACTER.

Antennæ moniliform: feelers six, growing larger towards the end: thorax marginate: wing-cases immarginate: body mostly oval.

## SPECIFIC CHARACTER

AND  
SYNONYMS.

Thorax red, with two black dots: wing-cases yellow, with a cross and four dots of black.

**CRIOCERIS ASPARAGI**: thorace rubro: punctis duobus nigris, coleoptris flavis: cruce punctisque quatuor nigris.  
*Fabr. Sp. Inf.* 1. *p. 155.* *n. 35.*—*Mant. Inf.* 1. *p. 90.* *n. 45.*

**CHRYSOMELA ASPARAGI**. *Linn. Syst. Nat.* xii. 2. *p. 601.* *n. 112.*  
 —*Fn. Suec.* 567.

**CRIOCERIS Geoffr. Par. Inf.** 1. 241. *n. 3.*

**ATTELABUS ASPARAGI**. *Scop. Ent. Carn.* 113.

This pretty coleopterous insect is found in June on the Asparagus, when in seed. Linnæus calls it *Asparagi*, from the larva feeding on the

the leaves of that plant. It is a common insect, and particularly destructive in some seasons to the plant which constitutes its ordinary food. As an object for the opaque microscope this little insect is very beautiful. The natural size is given at Fig. 1. and the magnified appearance above.





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## PLATE XXIX.

FIG. I.

## TRICHODA MELITEA.

## GENERIC CHARACTER.

An invisible, pellucid, hairy Worm.

## SPECIFIC CHARACTER.

Oblong ciliated trichoda; with a dilatable neck, the apex globular, and surrounded with hairs. Müller's *Animacula Infusoria*, &c.

Invisible to the naked eye, and rarely found except in salt-waters, although we have met with one specimen in the water of the Thames;

FIG. II.

## VORTICELLA NASUTA.

## GENERIC CHARACTER.

A Worm, capable of contracting or extending itself, naked, with rotatory cilia.

## SPECIFIC CHARACTER.

Cylindrical, with a prominent point in the middle of the cup. Müller's *Anim. Infus.*

Is invisible to the naked eye, appears of an unequal size, before the microscope is pellucid, with the fore part truncated and ciliated, and moves in the water with great alertness, by the assistance of the circle of hairs which encompasses the body.

L

FIG.

## FIG. III.

## VORTICELLA VIRIDIS.

## GENERIC CHARACTER.

A Worm capable of contracting or extending itself, naked, with rotatory cilia.

## SPECIFIC CHARACTER.

Cylindrical, uniform, green, and opaque. *Müller's Anim. Infus.*

---

The naked eye discovers this species as a mere point : when magnified it is of a dark green colour, almost opaque, nearly cylindrical, obtuse at the extremities, and destitute of limbs. It moves circularly, or in a strait direction, and causes such an agitation of the water, that notwithstanding its appearance, some rotatory instrument must be concealed within the body, which the creature can put forth at pleasure.









## PLATE XXX.

## PHALÆNA SALICIS.

## WHITE SATIN MOTH.

## GENERIC CHARACTER.

Antennæ tapering from the base: wings in general deflected when at rest. Fly by night.

\* *Bombyx.*

## SPECIFIC CHARACTER

AND

## SYNONYMS.

Wings white: legs black, with white rings.

**PHALÆNA SALICIS**; alis albis, pedibus nigro albo annulatis. *Linn.*  
*Fn. Suec.* 1. p. 822. 2. n. 1129.—*It. Scan.* 167.  
 307.—*Scop. Ent. Carn.* 495. *Fabr. Sp. Inf.* 2.  
 p. 193. n. 103.—*Mant. Inf.* 2. p. 126. *Gmel.*  
*Linn. Syft. Nat.* 2423. 46.

---

Very numerous about London, and are often found in the state of larva, pupa, and moth at the same time, as there are more than one, or perhaps even two broods in the year. Commonly the larva changes to the pupa form in June, and the Fly appears in July.

The species feeds principally on the Willow, Osier, and Poplar.











## PLATE XXXI.

FIG. I.

MUSCA CHAMÆLEON.

CHAMÆLEON-FLY.

DIPTERA.

GENERIC CHARACTER.

Mouth with a soft exserted fleshy proboscis and two equal lips: sucker furnished with bristles: feelers two, very short or none: antennæ generally short.

SPECIFIC CHARACTER

AND

SYNONYMS.

Scutel bidentated and yellow: abdomen black, with lateral yellow bands.

MUSCA CHAMÆLEON. *Linn. Syst. Nat. 2. 979. 3.*

STRATIOMYS CHAMÆLEON: scutello bidentato luteo: abdomine nigro: fasciis lateralibus luteis. *Fabr. Ent. Syst. T. 4. 263. 3.*

STRATIOMYS. *Geoffr. Inj. 2. 479. tab. 7. fig. 4.*

Linnæus, in a former edition of the *Fauna Suecica* gave this insect the name of *Oestrus Aquæ*, but he afterwards discovered it to be a Musca, and called it Musca Chamæleon. It is a common insect in some situations, but yet though well known in its perfect state, few have attended so minutely to its changes as to discover that these form

the most singular part of its history.—The female deposits her eggs in the hollow stalks of aquatic plants, or broken reeds, or so provides for them that they cannot, but by some unforeseen accident, be carried away. The egg, in due time ripening, produces a Larva, no way resembling the Parent, but rather a Worm of a most singular structure. This happens about the latter end of *May*, or beginning of *June*, if the weather proves favourable; they will then be found in shallow standing waters, crawling on the grass or plants which grow there, or they may be taken floating on the surface of the water. The whole consists of twelve annular divisions, of which the Head and Tail are two. The Tail has a verge of hairs, which, when entirely expanded, support the creature on the surface, with its head downwards. If it wishes to descend, it contracts the hairs in the form of a wine glass, or entirely closes them at the end; and when again it is rising to the surface, it forces a bubble from a small aperture in the center, which immediately makes a passage for its ascension. After remaining some time in the pupa state, the Fly is produced: this appears about the middle of *July*. The nectareous juices of flowers, which it extracts by means of its proboscis, or sucker, from the corolla of flowers, constitute its principal food in the perfect state.

---

## FIG. II.

## MUSCA PENDULA.

## PENDULUM-FLY.

## SPECIFIC CHARACTER

AND

## SYNONYMS.

Downy: thorax black, with four yellow lines: abdomen with three yellow bands.

Musca

MUSCA PENDULA. *Linn. Syst. Nat. 2. 784. 28.*

SYRPHUS PENDULUS: antennis setariis tomentosus thorace lineis  
quatuor, abdomine fasciis tribus flavis. *Fabr.  
Ent. Syst. T. 4. 282. 17.*

---

Its habits nearly correspond with those of the *Musca Chamæleon*. Like that insect it once bore the appearance of an aquatic insect, and like that also in its last or perfect state, exists upon the nectar of flowers. It is to be taken in June.

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FIG. III.

MUSCA LATERALIS.

RED SIDED FLY.

SPECIFIC CHARACTER

AND

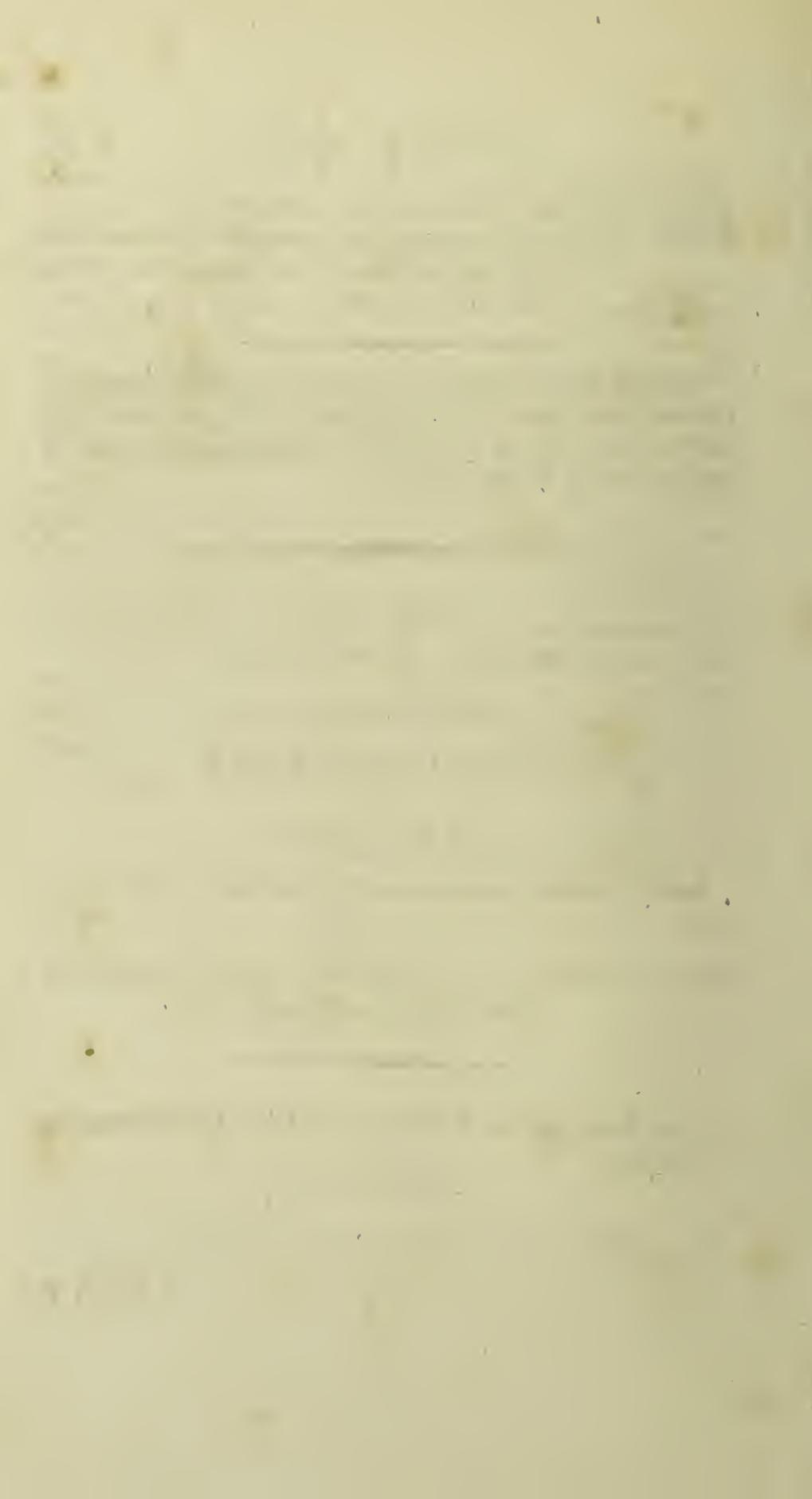
SYNONYMS.

Black: abdomen sanguineous at the sides, dorsal stripe and tip black.

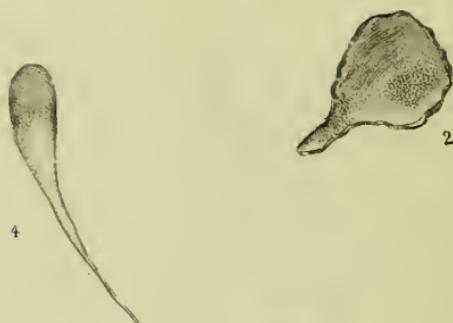
MUSCA LATERALIS: nigris abdominis lateribus basi sanguineis.  
*Fabr. Sp. Inf. 2. p. 443. n. 37.*

---

Visits flower gardens in the month of June. Its transformations are unknown.







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## PLATE XXXII.

F I G. I.

VIBRIO OLOR.

### GENERIC CHARACTER.

An invisible Worm, very simple, round, and rather long.

### SPECIFIC CHARACTER.

Elliptical, with a very long Neck, and a knob at the Apex.  
*Müller's Ani. Inf.*

---

The neck of this Creature is in continual motion, and the whole body is dilatable. It is found in water, replete with decayed vegetables.

---

F I G. II.

KOLPODA MILEAGRIS.

### GENERIC CHARACTER.

An invisible, very simple, pellucid, flat, crooked Worm.

### SPECIFIC CHARACTER.

Changeable, with the fore part like a hook, the hind part folded up. *Müller's Ani. Inf.*

F I G.

## FIG. III. and FIG. IV.

## PROTEUS TENAX.

## GENERIC CHARACTER.

An invisible, very simple, pellucid Worm, of a variable form.

## SPECIFIC CHARACTER.

Running out into a fine point. Müller. *Ani. Inf.*

---

A gelatinous pellucid body, stored with black molecules; it changes its form in a regular order, first extending itself out in a strait line, the lower part terminating in an acute bright point, without any intestines, and the globules being all collected in the upper part. It next draws the pointed end up towards the middle of the body, swelling it into a round form. The contraction goes on for some time, after which the lower part is swelled as in Fig. IV. The point is afterwards projected from this ventricose part. It passes through five different forms before it arrives at that represented at Fig. IV. It scarcely moves from one spot, only bending about sideways. It is to be found in river water, where the *Nitida* grows.—Adams on the Microscope.









## PLATE XXXIII.

FIG. I.

PHALÆNA BATIS.

LEPIDOPTERA.

PEACH-BLOSSOM MOTH.

\* *Noctua*.SPECIFIC CHARACTER  
AND  
SYNONYMS.

First wings fuscous, with five peach-coloured spots, the lower ones cinereous.

**PHALÆNA BATIS:** alis primoribus fuscis: maculis quinque incarnatis, posterioribus albidis. *Fabr. Sp. Inf.* 2. *p. 216. n. 42.*

**Phalæna Noctua spirilinguis lœvis,** alis depresso: superioribus fuscis: maculis simul quinque albidis; inferioribus albis. *Linn. Syst. Nat.* xii. 2. *p. 836. n. 97.*

The Peach-blossom Moth at first sight so evidently distinguishes itself, that it can scarcely be mistaken. The upper or first pair of Wings have the ground of a brown colour, which in some directions of light assume a golden appearance; and on each Wing are five elegantly disposed spots of white, having each a center of the most beautiful bloom, or blossom colour, which blend into the white with the most exquisite softness. The under Wings are of a simple colour, and have only a transverse shade of a darker hue across the middle of each Wing.

Its

Its truly elegant appearance would alone be sufficient to claim our attention; but when we add that it is one of the rarest and most valuable specimens of British entomology, it will be considered as a compensation for those more common subjects occasionally introduced; and which the nature of our plan cannot permit us to refuse inserting.

Our endeavours to procure the Caterpillar have hitherto been ineffectual, although it is very probably to be taken early in the season, feeding on the bramble. It is described to be a brown larva, naked, or without hairs, with a conic gibbosity or rising on all the middle segments of the back, and one larger than the rest with a double pointed tip, towards the anterior part or head.

Our Fly was taken in Essex, July 14th. Has been met with in Combe wood.

---

### F I G. II.

#### PHALÆNA AMATORIA.

#### BLOOD VEIN, or BUFF ARGOS MOTH.

\* *Geometra.*

Wings pale, powdered with brown, with a straight purple line, and fuscous obsolete streak behind.

PHALÆNA AMATORIA: alis pallidis pulverulentis: fascia purpurea recta strigaque fusca repanda. *Linn. Fn. Suec.*  
1223.—*Fabr. Sp. Inf. 2. p. 242. n. 10.*

---

The Caterpillars of this Phalæna feed on the oak leaves. They are green, with yellow rings. The Fly is found in Essex very commonly in the month of July.









## PLATE XXXIV.

FIG. I.

CIRCULIO BACHUS.

COLEOPTERA.

## GENERIC CHARACTER.

Antennæ clavated, and seated on the snout, which is horny and prominent : feelers four filiform.

## SPECIFIC CHARACTER

AND

## SYNONYMS.

Golden red : snout and feet black.

CIRCULIO BACHUS: *aureus*, *rostro plantisque nigris*. *Fabr.*

*Sp. Inf. L.* 165.

Our figure represents the *Curculio Bachus*, as it appears before the Speculum of an Opake Microscope with a deep magnifier.

It is with this, as with many other species of insects, and particularly those of the Coleopterous Order, that unless they are in some measure magnified, much of their beauty will remain hidden, and much of their structure be enveloped in obscurity. It is not perfectly agreeable to our plan, and may admit of some blame from our subscribers ; but when objects so diminutive in size, and so complex in colour, offer to our attention, that it is not possible to represent them in their natural size, or in a manner satisfactory to ourselves, we must have recourse to the Microscope for assistance. We consider the confidence at present reposed in our accuracy, and attention, to the natural subjects, evident, from the general patronage bestowed on our attempt ; it is a spur to our exertions, and we will endeavour, as well by our future, as present correctness, to deserve a continuation of

that esteem, and encouragement, so liberally bestowed on our arduous undertaking.

C. Bachus is nearly a quarter of an inch in length, the wing-cases and thorax appear of a deep glossy purple, with much inclination to gold; a green and golden hue is also seen on every part of the body as it moves in various directions of light. The whole appears before the microscope besprinkled, and spotted with gold and purple; gold in those parts where the light is most powerful, and purple in the shadows. The Snout is black, or of a dark colour, as are also the Eyes; and the singular structure of the jointed Antennæ, placed on the snout, deserve particular notice. This beautiful insect is as rare, as it is superb, and the larva is scarcely, if at all known.—Our specimen was taken in the middle of June. It occurred in a field in Kent.

### FIG. II.

#### CUCULIO GERMANUS.

BLACK CURCULIO:

COLEOPTERA.

SPECIFIC CHARACTER

AND

SYNONYMS:

Body oblong-ovate, black with testaceous dots.

CURCULIO GERMANUS: corpore ovato-oblongo nigro punctis testaceis adperso. Linn. Syst. Nat. 613. 58.

An Insect found in abundance in Germany, and by no means uncommon in this and every other part of Europe. It is generally taken in June.









P L A T E    XXXV.

F I G. I.

Shews the natural size of the larva, of the

MUSCA CHAMÆLEON,

Described in Plate XXXI. of this work.

---

F I G. II.

As it appears magnified. We have taken it since that plate was finished, or we would have introduced it with the Fly. Being unacquainted with any perfect representation of this aquatic larva, we are happy to give it before the completion of the first volume.











## PLATE XXXVI.

FIG. I.

*LIBELLULA VIRGO. var.*

NEUROPTERA.

## GENERIC CHARACTER.

Mouth armed with more than two jaws: lip trifid: Antennæ very thin, filiform and shorter than the thorax: wings expanded: tail of the male furnished with a forked proceſs.

## SPECIFIC CHARACTER.

Wings coloured.—*Var.* Body shining blue green: wings bluish in the middle: margin immaculate.

**LIBELLULA VIRGO** ♂. Corpore sericeo nitido, alis viridi-cærulescentibus apice fuscis margine immaculatis. *Linn.*  
*Fn. Suec. L. 757.*

---

It is neither so large as to create terror by its appearance, or so beautiful as to claim the first place in a collection of British insects: notwithstanding there are many inferior to it both in elegance, and colour. The whole of the body is a deep purplish blue, which reflects on one part, a most brilliant colour with a greenish cast, and the clouds on the wings contribute much to its lustre. The Thorax and Head are nearly the same, some few shades of green excepted.

It

It is found in *May* and *June*, sporting on the waters, or among the bushes which overgrow the sides of pools, or gently flowing streams; at noon, or after a shower, when the sun breaks from its watery prison, and penetrates the thickets, and the groves with inviting warmth, they are seen issuing from the dark retreat, and overhanging shrubbery; to bask and wanton in its effulgent beams. In many parts on the banks of the *Thames* they heighten the scene by the glow and richness of their colouring; the green, the blue, and the red; the yellow, purple, and the brown, in their richest teints, according to the variety; and as they fly in various directions, display themselves in all their native elegance and splendor.

---

## FIG II.

## LIBELLULA PU LLA.

## RED VARIETY.

## SPECIFIC CHARACTER

AND

## SYNONYMS.

Body red with yellow and black lines at each segment: thorax green with yellow lines: wings with marginal spots.

LIBELLULA PUELLA  $\beta$ . Corpore incarnato, alis puncto marginali fusco. *Linn. Fn. Suec.* 8. n. 761.

---

The body is red, with a yellow band and black mark at every segment; the Thorax green, with longitudinal lines of yellow; the Wings are perfectly transparent, except a marginal spot on each. It is voracious, as are all the species of Libellula, whether in the larva or the winged state; it appears about the same time as the preceding, and is the produce of an aquatic larva.

I N D E X  
TO  
V O L. I.

C O L E O P T E R A.

					Plate
Cervus Lucanus.	Stag Beetle	-	-	-	- 13
Silpha Vespillo	-	-	-	-	- 23
Chrysomela Asparagi	-	-	-	-	- 30
Curculio Bachus	-	-	-	-	- 34
Curculio Germanus	-	-	-	-	- ib.
Leptura Arietis.	Common Wasp Beetle	-	-	-	- 27
Cicindela Campestris	-	-	-	-	- 12

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H E M I P T E R A.

Nepa Cinerea.	Water Scorpion	-	-	-	18
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L E P I D O P T E R A.

Sphinx Apiformis.	Hornet Sphinx	-	-	-	25
Sphinx Filipendulæ.	Burnet Moth	-	-	-	6
Phalæna Pavonia.	Emperor Moth	-	-	-	1
Phalæna Bucephala.	Buff Tip Moth	-	-	-	3
Phalæna Caja.	Great Tyger Moth	-	-	-	15
				Phalæna	

# I N D E X.

				Plate
Phalæna Salicis.	White Satin Moth	-	-	- 28
Phalæna Chrysorrhœa.	Yellow-Tail Moth	-	-	- 10
Phalæna Antiqua.	White Spot Tuftock Moth	-	-	- 16
Phalæna Amataria.	Buff Argos Moth	-	-	- 33
Phalæna Prunaria.	Orange Moth	-	-	- 21
Phalæna Grossulariata.	Currant Moth	-	-	- 4
Phalæna Batis.	Peach Blossom	-	-	- 33
Phalæna Christiernana	-	-	-	- 20
Phalæna Evonymella.	Ermine Moth	-	-	- 9

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## N E U R O P T E R A.

Libellula Depressa.	Dragon Fly	-	-	-	- 24
Libellula Virgo	-	-	-	-	- 36
Libellula Puella	-	-	-	-	- 36

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## H Y M E N O P T E R A.

Chrysis Ignita	-	-	-	-	-	- 7
Chrysis Bidentata	-	-	-	-	-	- 19

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## D I P T E R A.

Tipula Plumosa	-	-	-	-	-	- 22
Musca Chamæleon	-	-	-	-	-	- 31
Musca Pendula	-	-	-	-	-	- ib.
Musca Lateralis	-	-	-	-	-	- ib.

## A P T E R A,

# I N D E X.

## A P T E R A,

### ANIMALCULA, &c.

				Plate
Acarus Coleoptratorum.	Beetle Tick	-	-	- 11
Monculus Quadricornis	-	-	-	- 2
Monoculus Conchaceus	-	-	-	- 5
Proteus Tenax	-	-	-	- 32
Vibro Olor	-	-	-	- ib
Kolpoda Mileagris	-	-	-	- ib.
Bursaria Hirundinella	-	-	-	- 5
Trichoda Cometa	-	-	-	- 26
Trichoda Longicauda	-	-	-	- ib.
Trichoda Melitea	-	-	-	- 29
Trichoda Pocillum	-	-	-	- 14
Trichoda Uvula	-	-	-	- 8
Trichoda Vermicularis	-	-	-	- 17
Himantopus Ludio	-	-	-	- 20
Vorticella Lunaris	-	-	-	- 8
Vorticella trochiformis Nigra	-	-	-	- 26
Vorticella Nasuta	-	-	-	- 29
Vorticella Urceolaris	-	-	-	- 17
Vorticella Viridis	-	-	-	- 29



# I N D E X.

## S P E C I F I C   N A M E S,

A L P H A B E T I C A L L Y   A R R A N G E D,

T O

V O L. I.

					Plate
Amataria, Phalæna	-	-	-	-	- 33
Antiqua, Phalæna	-	-	-	-	- 16
Api-formis, Sphinx	-	-	-	-	- 25
Arietis, Leptura	-	-	-	-	- 27
Asparagi, Chrysomela	-	-	-	-	- 30
Batis, Phalæna	-	-	-	-	- 33
Bidentata, Chrysis	-	-	-	-	- 19
Bucephala, Phalæna	-	-	-	-	- 2
Caja, Phalæna	-	-	-	-	- 15
Campestris, Cincindela	-	-	-	-	- 12
Chamæleon, Musca	-	-	-	-	- 31
Christiernana, Phalæna	-	-	-	-	- 20
Chrysorrhœa, Phalæna	-	-	-	-	- 10
Cinerea, Nepa	-	-	-	-	- 18
Coleoptratorum, Acarus	-	-	-	-	- 11
Cometa, Trichoda	-	-	-	-	- 26
Conchaceus, Monoculus	-	-	-	-	- 5
Evonymella, Phalæna	-	-	-	-	- 9
Filipendulæ, Sphinx	-	-	-	-	- 6
Grossulariata, Phalæna	-	-	-	-	- 4
Ignita, Chrysis	-	-	-	-	- 7
Lateralis, Musca	-	-	-	-	- 31
Longicauda, Trichoda	-	-	-	-	- 26
					<i>Lucanus,</i>

## I N D E X.

L.

<i>Lucanus, Cervus</i>	-	5	-	-	-	-	13
<i>Ludio, Himantopus</i>	-	-	-	-	-	-	20
<i>Lunaris, Vorticella</i>	-	-	-	-	-	-	8
<i>Melitea, Trichoda</i>	-	-	-	-	-	-	29
<i>Mileagris, Kolpoda</i>	-	-	-	-	-	-	32
<i>Nasuta, Vorticella</i>	-	-	-	-	-	-	29
<i>Olor, Vibrio</i>	-	-	-	-	-	-	32
<i>Pavonia, Phalæna</i>	-	-	-	-	-	-	1
<i>Pendula, Musca</i>	-	-	-	-	-	-	31
<i>Plumosa, Tipula</i>	-	-	-	-	-	-	22
<i>Pocillum, Trichoda</i>	-	-	-	-	-	-	14
<i>Prunaria, Phalæna</i>	-	-	-	-	-	-	28
<i>Quadricornis, Monoculus</i>	-	-	-	-	-	-	2
<i>Salicis, Phalæna</i>	-	-	-	-	-	-	28
<i>Tenax, Proteus</i>	-	-	-	-	-	-	32
<i>Trochiformis nigra, Vorticella</i>	-	-	-	-	-	-	26
<i>Vermicularis, Trichoda</i>	-	-	-	-	-	-	17
<i>Vespillo, Silpha</i>	-	-	-	-	-	-	23
<i>Viridis, Vorticella</i>	-	-	-	-	-	-	29
<i>Urceolaris, Vorticella</i>	-	-	-	-	-	-	17
<i>Uvula, Trichoda</i>	-	-	-	-	-	-	8

E R R A T A    T O    V O L . I.

PLATE XXXIV. for *magnifying times*, read *magnifying four times*  
for 6. *Bachus* is near in length, read *C. Bachus*  
*is near four Lines in length*

FIG. II. for *Cuculio*, read *Curculio*

